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Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE, P.Q., January 5, 1922. No. 1

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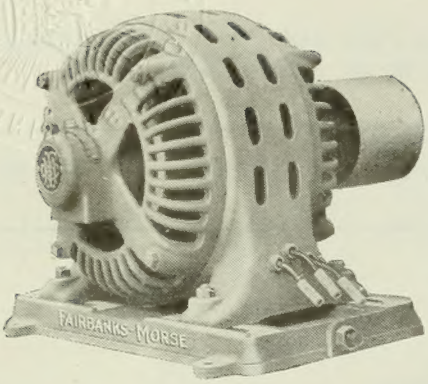

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:-: EDITORIAL :-:

WHAT ABOUT 1922?

Guessing on the outcome of the year 1922 is about like guessing on the result of a horse race, except that the stake in the former case is infinitely larger. But the performance that can be expected from a horse can be foretold from knowledge of his record, his condition and his driver. These same factors influence one's judgment when looking into the future of industry. Unfortunately, history does not follow straight lines and this makes prophecy difficult. The man of faith, however—and successful men are men of faith—will study these factors and make a definite plan. He will not drift and hope something will turn up. The one who does that is likely to have something turn up, often a snag upsets, or threatens to upset, his craft. It is far better to plan on how to dig something up.

A review of the past year, perhaps better the two past years, will give a fair basis from which to look into the future. The year 1920 was a boom year in practically every industry. There has never been a boom which was not necessarily followed by a period of reaction. The old adage that "what goes up must come down" holds true generally of industries as well as of objects and the higher the object goes the farther is has to fall. Most products of the Pulp and Paper Industry did not go so high relatively as many other commodities. Furthermore, while things were going up there were a number of instances where the basis of reference actually changed to a higher level, so that while there was a relative rise there was also an actual and permanent elevation. Certain basic factors as wages and land values have registered a permanent increase, which will operate necessarily to prevent a complete return to conditions that existed, say, in 1913. The present season of unemployment, which is undoubtedly but a temporary, though unfortunately an exceedingly unpleasant experience, with its usual accompaniment of low emergency wages in some places and some lines cannot be taken as typical of the general situation.

The history of the industry during these past two years, brings us from the peak period down through gradually increasing depression of the winter and spring of 1921 into the dull and dreary months of the summer. There is usually a seasonal slump in business during the hot weather but this did not take place to the usual extent in 1920, so that the experiences of the past summer seemed even worse in comparison though they were bad enough anyway. With the coming of autumn there were some indications and many hopes that the general business situation would show marked improvement. There were some who looked for an immediate change for the better. Prices had been dropped in some cases suddenly to the bottom figure and in other cases in an orderly manner, which assisted merchants to work off high cost materials without undue losses. A feeling persisted, however, that there was still a margin of slack to be taken up before prices would be on the rock bottom and this feeling, together in many cases with lack of cash with which to make more extensive purchases, influenced or obliged many consumers to keep their orders within the limits of such quantities as could be rapidly assimilated or turned over. There was, however, a noticable increase in the quantities actually handled, partly by virtue of larger orders, but rather because of their greater frequency. It became increasingly noticeable that orders were more and more for immediate delivery, indicating that consumers' stocks were rapidly approaching, or had reached, a very low point. As winter came on and the holiday season approached, certain lines of pulp and paper products showed a very encouraging improvement. Prices in most lines had become stabilized and in some even registered a slight advance. The price of newsprint, which is Canada's largest single branch of the industry, had been brought down gradually from a high figure of $130 a ton to $80, and when the price for the New Year was announced at $70, a feeling was apparent that the bottom had been reached and an attitude of confidence was manifest in the inclination of purchasers to make arrangements for a full year's requirements. During the period of this decrease in price, there was noticeable a very well maintained demand so that, although orders were for short periods and relatively small amounts as compared with former years, the total tonnage required kept the mills quite reasonably busy. It is probable that had there been no increase in capacity the Canadian mills would have had to operate at full time in order to fill their customers' wants.

The success of the paper industry in Canada is to a considerable extent dependent upon general business conditions in other countries, particularly in the United States, and conditions there have been none too good since last spring. There is, however, a growing importance to the domestic market and the increase in this demand, which has been accompanied by an increasing tendency on the part of Canadian consumers to use Canadian made goods has manifested itself in the strength of our domestic markets. This is a happy tribute to the soundness of Canadian business enterprise in general and shows that Canada is growing, both as an industrial nation and as a self-supporting people.

The market conditions affecting the prosperity of the Canadian Pulp and Paper Industry are as wide as the world, for our products find use in every continent and in nearly every country. The general disorganization of business and credit throughout the world has had its effect apparently in the way limiting exports to markets already familiar with and favorable to the Canadian product and also in hindering to some extent the further expansion of trade in these directions. The success attending the Washington conference on the limitation of armaments and the inclination of nations to come to an agreement with regard to international debts, promises a stabilization of financial conditions in the world's markets that will inspire confidence on the part of those who should be able to extend their consumption of our products. People are not inclined to urge the purchase of their products upon parties who are not likely to pay for them, but it looks as if this condition is on the point of being improved.

A number of mills have brought out their annual statement covering at least a part and usually the worst part of the past year; an analysis of them shows that the Canadian Pulp and Paper Industry is in a very healthy condition. Like other industries, there were some concerns that had quite a high fever, but the reports show that most of our mills have had a good sweat and worked off enough of the excess temperature to bring conditions down to normal. It could certainly be said that there is no delirium at the present time but a cool, determined, contemplation of the immediate future which promises successful operations from now on. The losses registered appear for the most part to be due to writing off the difference between actual cost of materials and replacement values. This has brought most business down to a level of selling prices much below what they have been for several years and which leave but a small margin of profit at the present time; even in some cases possibly not giving a real profit, but a price at which sales of product permit the operation of the plant. A number of proposed developments have not been carried forward but the occasional slackness has permitted the mills to get their equipment in first class operating condition and has encouraged the most efficient management and efficient work on the part of the employees.

Having thus looked briefly at the record and the condition of the industry it is well to turn our attention for a moment to those who are guiding its destiny. There is probably no large industry that has gone through the strenuous times of the past year with so little serious effect as the Pulp and Paper Industry. This successful weathering of a serious storm shows the calibre of the men in charge of our Pulp and Paper Mills. Even where misfortune has temporarily overtaken a few concerns, there is still a chance of pulling them through and there is every reason to believe that with the able leaders still in charge that 1922 will not only be noticeaobly better than 1921 but will see both our industry and our Dominion well on the road to permanent prosperity. The hopes of 1921 become faith in 1922.

It is on this basis and with this faith in the future that the Pulp and Paper Magazine extends to all its friends and readers a sincere wish for a Happy and Prosperous New Year.

The Editor and Publishers of the Pulp and Paper Magazine wish to express their sincere thanks for the many calendars, and other tokens of good will and good wishes that have helped make this Christmas a very happy memory.

GOOD CHEER.

(From The Crest.)

After all, it hasn't been as bad as we feared—has it, this year of 1921, just closing?

Not half of our worries have materialized, in fact, the slinking, wisp-like ghosts of dark foul fear have not conquered our souls. It might have been much worse.

The "worst," which we feared, did not happen. It never does.

Perhaps we all thought and worried too long and didn't act soon enough: then found ourselves overtaken by a reasonable demand which, with more action and a little more effort, could have come sooner.

And now, 'tis just about over—the worst of 1921 lies behind us.

We've all had some worries and troubles. We've had some pleasures too and our health's pretty good and we've all a few orders on our books. Well, what the ———Here's to 1922. Let's make it count.

"Day's at the morn;
Morning's at seven;

. . . . . .

God's in His heaven—
All's right with the world!"

The Editor knows someone who wants to buy a second-hand wet machine.

URGES NEW SYSTEM OF APPRENTICESHIP.

That there is a need for the building up of a new system of apprenticeship, closely allied with the work of the Technical Schools of the province, is the view of Dr. F. W. Merchant, Director of Industrial and Technical Education for Ontario, who addressed the Society for the Promotion of Engineering Education. Dr. Merchant declared that the apprenticeship system had broken down and that training for industry and commerce was now in a period of reconstruction. The tendency to-day was to make the practical training of the apprentice a specialized service and to place the burden of this training on the vocational schools.

"Wot's a minimum wage, Albert?"

"A minimum wage? W'y its wot yer gets fer goin' to yer work. If yer wants ter make a bit more, yer does a bit o' work for it."—Ex.

Pumps and their Characteristics

By E. F. DOTY, North Tonawanda, N. Y.

Introduction.

In order to assist the Joint International Committee on Education, both financially and in attracting criticism of certain sections of their Text-books, the Pulp and Paper Magazine has arranged to co-operate with the Committee by the publishing of some of the material submitted to the editor of the Text-books. In presenting this series of articles on Pumps to our readers, a cordial invitation is extended to assist the Committee by suggestions and criticisms of this material. It is hoped that in this way omissions and errors will be noticed and corrected.

PUMPS AND PUMPING MACHINERY.

CHAPTER I.

Introductory

From the earliest development of the pulp and paper making industry, one of the most essential requirements of the plant has been the pumping equipment.

The pumps and piping systems connected thereto may truly be called the heart and main arteries of the pulp and paper mill, for indeed the operation of the plant is entirely dependent upon them and it is therefore highly important that the mill engineers and operators study carefully the proper types of pumps for their several services, the best features of design as well as those to be avoided, and the care and methods of operation for obtaining satisfactory results.

At the beginning of pulp and paper mill development certain types of pumps were selected and applied to the various uses about the mill on account of their peculiar adaptability for the work to be done and with few exceptions these types are in use today and have become standardized for their several uses about the mill.

Certain improvements and modifications have been made which will be treated in a later chapter.

CHAPTER II.

Types of Pumps.

These are generally classified in two main groups viz:—

1. **Steam Pumps.**—Where the power for operating the pumping mechanism is a part of a self-contained pumping unit.

2. **Power Pumps.**—Where the power for operating the pumping mechanism is a separate unit such as in belt driven and electric motor driven pumps. These main groups are then sub-divided into several distinct types of which the leading features are as follows:—

Steam Pumps.

1. Direct Acting Steam Pumps.

(a) **Single Cylinder Pumps**—Consisting of one one steam cylinder and piston connected through the piston rod to a water piston and cylinder.

(b) **Duplex or Double Cylinder Pumps.**—Consisting of two steam cylinders and pistons side by side, direct connected through the piston rods to two water pistons and cylinders.

2. Crank and Flywheel Steam Pumps.—These pumping units consist of one or more steam cylinders, with pistons driving the pistons or plungers in one or more water cylinders through a crank shaft and connecting rods which ensure a positive and uniform length of stroke.

The flywheel feature is added for the purpose of furnishing impulse or stored up energy to carry the crank over its dead center point at the end of each stroke and start the rotatory parts of the pump on the return stroke.

Power Pumps.

This is a large group, and under this heading will come all types of pumps which are dependent for their operation upon a source of power outside of the pumping unit itself.

Under this heading there will be enumerated the different types of pumps which in turn will be more fully described under the heading relating to each particular type.

The main sub-divisions of power pumps therefore are:—

Simplex, Duplex and Triplex plunger or piston pumps, which as their names imply, consist of one, two or three pump cylinders, with pistons or plungers operating in unison and driven from a common crank shaft.

Centrifugal Pumps.

These come under the heading Power Pumps and this pump consists of one or more rotating runners or impellers, mounted on a common shaft and rotating within a casing which forms the pressure chamber—and depends upon the centrifugal force of the impeller to build up pressure.

Rotary Pumps.

This type consists of a revolving element mounted on either one or two shafts which rotates within a casing or pressure chamber. The action of these rotors is a positive displacement of the fluid pumped and it is not dependent upon centrifugal force to develop or build up pressure.

Deep Well Pumps.

These consist of a single vertical cylinder or "Working Barrel" projected into the open well or well casing within reach of the water and connected by rods to the Power Head which may be located at any convenient height above the suction water level.

Air Lift Pumps.

These properly come under the heading of Power Pumps also, as they consist of a jet containing compressed air, which is inserted into the well tubing and are dependent upon an Air Compressor for their source of power.

Reciprocating Pumps.

Principles of Operation.—This type of pump works on the principle of actual displacement; that is the water forced out through the discharge valves and pipe is pushed along by a piston or plunger working back and forth within the water cylinder.

The usual part of the pump which serves to displace water in the cylinder is the piston or the plunger.

The piston or plunger is usually of cylindrical section.

The Piston, therefore, consists of a cylindrical metal displacer, working in a close fitting water cylinder or barrel (A), the leakage past the piston (C) is prevented by packing (B) which is part of the piston and moves with it (see Fig. 1). **The Plunger** consists of a cylindrical metal displacer working through a stuffing box (D) in the water cylinder and leakage is prevented by the packing in the stuffing box which is stationary.

Plungers may be of the Single Acting type as in most forms of Triplex Power Pumps (see Fig. 2). Or they may be of the Double Acting End Packed type as used for high pressure hydraulic pumps (see Fig. 3). Or they may be of the Double Acting Center type as used for Boiler Feed service of handling gritty water (see Fig. 4).

The capacity of discharge for any reciprocating pump is represented by an amount of water or other liquid equal to the area of the piston or plunger multiplied by the length of the stroke and the capacity for any given period of time is the sum of the displacement, (area of piston x length of stroke) multiplied by the number of strokes made by the pump within the period of time which is being considered.

The operation of the inlet or suction valves and the outlet or discharge valves with relation to the movement of the piston or plunger is an important matter to comprehend as it forms the basis of the operation of all reciprocating pumps.

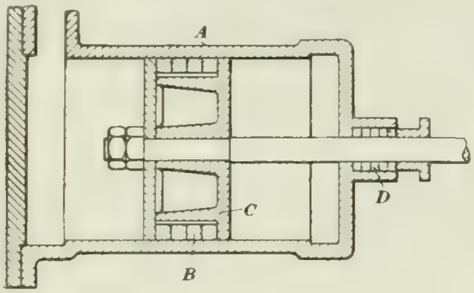

Fig. 1.

Whether the pump is operating under conditions requiring it to lift the water from a level below the suction valves or whether the level of water at the intake side of the pump is higher than the suction valves the operation of the suction valves throughout the cycle of operation remains the same.

Since the only force operating to lift water to the intake level is the difference between the atmospheric pressure on the free surface in the well and the pressure of the pump, the height of the suction left cannot exceed 34 feet, which is the height of a column of water equivalent to atmospheric pressure.

The operating cycles of a reciprocating pump consists of two strokes of the piston or plunger; the first stroke is termed the suction stroke, that is, the piston moves away from the suction valves, leaving space equal to its displacement and permitting the suction valves to open and fill the space with liquid; upon the return or discharge stroke of the piston the suction valves are held in closed position while the discharge valves open and the liquid displaced by the piston during the discharge stroke is forced through the discharge valves and out into the delivery pipe.

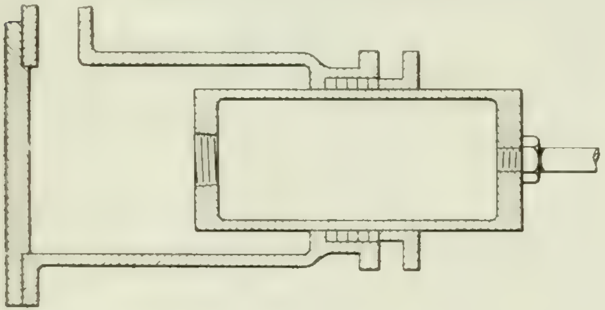

Fig. 2.

This cycle of operation is shown in diagram by Fig. 5 showing the suction stroke with liquid entering at A and Fig. 6 showing the discharge stroke, with liquid leaving at B.

These figures show clearly the operating cycle of the single acting reciprocating pump.

The double acting pump is similar in its action except this, that each stroke of the piston includes both a suction and discharge element, that is while the piston is moving away from the suction valves at one end of the pump cylinder it is at the same time forcing liquid through the discharge valves at the opposite end of the cylinder and on the return stroke this operation is repeated with the valves at the opposite ends of the cylinder coming into action.

Fig. 7 shows in diagram the performance of the double acting reciprocating pump, with liquid entering at A and the previous charge leaving at B. On the return stroke, C is the feed port and D the discharge.

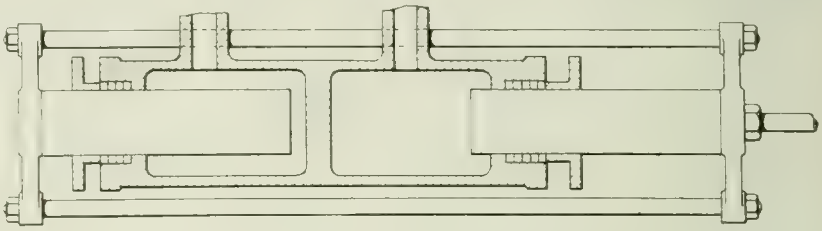

Fig. 3.

In the following Chapters III to IX inclusive each type of pump will be described and its particular field of usefulness will be explained.

CHAPTER III.

The Direct Acting Steam Pump.

When the steam piston is direct connected to the water piston or plunger by means of an intermediate piston rod and without any other devices the pump is known as the Direct Acting type.

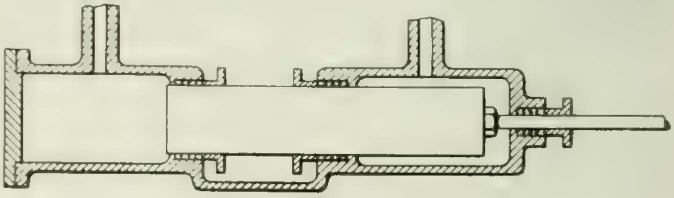

Fig. 4.

Single Cylinder or Simplex Direct Acting Pumps.

These are so named for the reason that the pumping unit consists of one steam piston and one steam cylinder the piston being direct connected by a piston rod to a water piston or plunger working in a single water cylinder.

The single cylinder pump may be of either horizontal

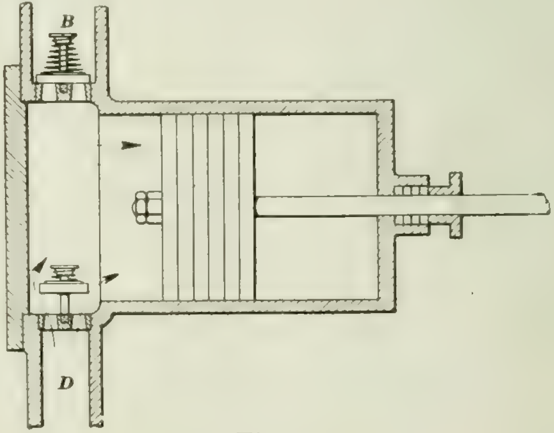

Fig. 5.

or vertical construction, that is the piston and other moving parts may work in either a horizontal or vertical plane; the latter construction is usually adopted for marine service on account of requiring less floor space than the horizontal pump.

Pumps and Pumping Machinery.

The special feature of the Single Cylinder pump and wherein it differs from all other pumps lies in the peculiar steam valve operating mechanism which is necessary to secure a proper opening and closing of the steam inlet and exhaust ports when operating at any speed within the capacity of the pump.

The steam valve mechanism of the Simplex pump is somewhat more complicated than that of the Double Cylinder of Duplex pump but with a properly designed Simplex pump there is somewhat less possibility of short stroking, that is, not making a full length stroke at all speeds, and in many cases the speed or number of strokes may be increased above that of the Duplex pump.

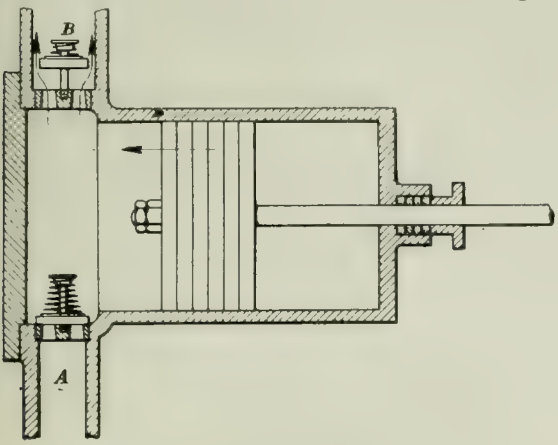

Fig. 6.

A complete sectional view of a typical Simplex pump taken through the entire length of the machine is shown in Fig. 8 which illustrates one of the simpler forms of standard design and it will be seen that the steam valve equipment consists of two valves, the control or pilot valve A, which is connected to the piston rod by a link B and lever C and a main valve D which is steam operated under control of the pilot valve and is moved by a floating piston E. There are likewise two sets of steam and exhaust ports—the set of ports marked F located between the pilot valve and the floating piston and ports marked G, located between the main valve D and the steam cylinder, H. P is the piston rod, W the water cylinder, and S adjusting nuts on valve spindle.

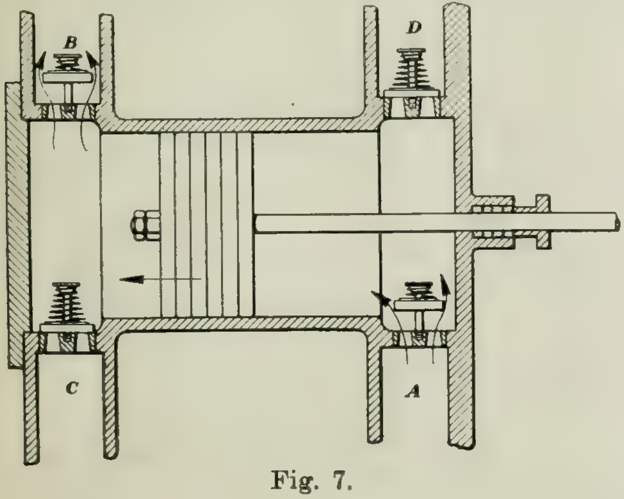

Fig. 7.

The operation of the steam valve mechanism is as follows:—

The pilot valve is always set when the pump is assembled so that the steam port at one end is open between the upper steam chest and the corresponding end of the floating piston E, the live steam pipe from the boiler being connected by a port leading to the upper steam chest and also to the steam space which surrounds the center of the floating piston E.

When it is desired to start the pump in operation the starting valve in the live steam pipe is opened, admitting steam to these chambers and to one end of the floating piston E which moves towards the opposite end of the steam chest and carries the main valve D with it thus uncovering the steam port leading to the steam cylinder and piston and starting the pump in motion. With the pump put in motion the pilot valve A is controlled by the link B and lever C moved by the piston rod and thereby the steam inlet at each end of the cylinder is controlled at each stroke as stated above.

The exhaust steam is discharged through separate ports at each end of the steam cylinder and also at each end of the pilot valve steam chest. The exhaust is discharged through the centre of main and pilot valves into an exhaust steam channel located at one side of the live steam passages and which leads directly to the exhaust pipe connection. This type of valve mechanism has no "dead center" on which the pump can stop while the steam pressure is turned on and all successful single steam pumps are designed on this principle of operation.

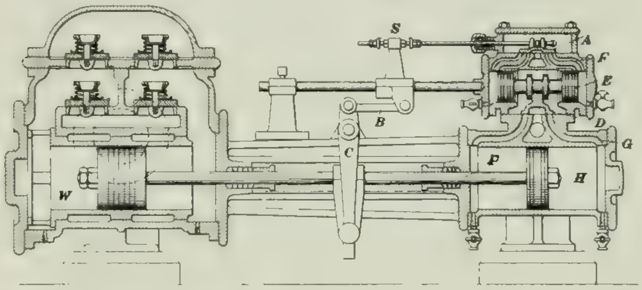

Fig. 8.

Other types of valve gear are in existence which have no valve gear outside the pump with the exception of a hand lever attached to a central valve stem. This type of gear will work very satisfactorily when the pump is operating at fairly high speed but when it is necessary to reduce the speed for conditions such as boiler feeding it will be found that the pump is inclined to get on "dead center" and stop running unless the hand lever is given an occasional shove by an operator. This tendency towards uncertain operation is likely to be serious under some kinds of service where constant, positive and reliable operation is essential.

The simplex steam pump is perhaps not as popular generally as the Duplex steam pump though there are many engineers who have a strong preference for the Simplex type. Generally speaking it is more economical in the use of steam than the Duplex pump for the reason that the clearance spaces in the steam cylinder may be reduced in volume for a pump of given capacity and it is well known that the steam required to fill these clearance spaces and ports exerts no useful effort against the steam piston and is therefore a total loss as it passes through the steam cylinder into the exhaust.

The Simplex pump is built with the several forms of liquid cylinders, pistons or plungers, and pump valves as in the case of the Duplex pump and these various types of standard pump ends will be described a little later on, also these pumps are built for light, medium and heavy pressure service and are in demand for general purpose pump such as boiler feeding in plants up to approximately 2,500 boiler H.P. capacity, steam heating vacuum systems and whatever moderate vacuum is required, small water supply where intermittent duty is required, hydraulic elevator service and heavy pressure hydraulic service. The principal uses for which these pumps are found in pulp and paper mill service being as boiler feeders and vacuum pumps and for fire service.

(To be continued.)

BRITISH VS. GERMAN DYES—A COMMUNICATION.

The Editor,
"Pulp and Paper Magazine."

Dear Sir,—In a recent issue of the "Hamilton Spectator," it is stated that, while there has been very little demand in Allied countries for goods of German manufacture since the outbreak of war, the sale of German dyes in Canada and the United States forms an exception. It is stated that the reason for this is that, although several substitutes have been tried in Canada, Great Britain and the United States, scientists have not yet discovered anything that compares with the German product. A traveller for a large Montreal firm is reported as having stated that Hamilton merchants had purchased large quantities of German dyes.

According to my information, the last mentioned statement is not quite accurate, as British dyestuff makers in close touch with the Hamilton trade do not agree that large sales of German dyes have been made in that district. This would appear to be borne out by the statistics of aniline dyes to Canada during the month of September last. These are:

Canadian Imports from	Lbs.	Value
United Kingdom	21,000	$21,000
United States	92,000	91,000
Germany	4,800	15,000
Switzerland	10,000	16,000

It would seem, therefore, that the British and American houses are importing colors at the value of about $1.00 per lb.; in fact, for a period of six months, ended September, it will be found that the United Kingdom dyes were valued at an average of 60c. per lb.; whilst the German values for the same period worked out at $3.00 per lb. This looks as if they are able only to import and sell their so-called high-priced specialties, and it is admitted that they will always have certain lines on which neither the United Kingdom nor the United States manufacturers will be able to compete.

The statement also that British firms can make only substitutes is quite incorrect, as it has always been the policy of British manufacturers not to manufacture any color unless they are able to do so in sufficient quantities and at a price and quality which would yield at any rate a fair share of the world's business. Hence the products already made do not fear comparison with any chemically similar compounds of either German, Swiss or American make.

Before the war Germany had to depend on outside sources for her supply of coal-tar-intermediates, and seeing that she has now lost her best coal fields, it is apparent that she will now have to purchase more of these intermediates from outside sources than before. In view of Germany's depreciated currency it is apparent that she will now have to pay high prices for her raw materials, and unless her exports of dye-stuffs are far greater than her imports of raw materials, the state of her exchange will operate very much against her.

The methods by which Germany obtained domination in the dye-stuffs industry are too well-known to need enlarging upon further, and I can assure you that British manufacturers are keenly alive to the business to-day. There is a tendency on the part of Canadian buyers to obtain samples and quotations from German makers, but at the same time British firms are being given every assistance by Canadian business men to meet whatever prices are being quoted by German competitors.

I have confidence in the common sense of the Canadian user and also in the ability of the British manufacturer to give Canada exactly what she requires and feel that our German competitors will meet much difficulty in their efforts to obtain the control of the Canadian dye-stuff industry again.

British manufacturers are faced with keen American competition. There is an embargo in the United States which keeps out all foreign dyes (including British) and this being the case our American competitors can obtain their own prices in the United States and offer very low prices in Canada. This sort of competition is difficult to meet.

Yours faithfully,
G. P. MILNE,
H. M. Senior Trade Commissioner in Canada and Newfoundland.

CERTIFICATES OF ORIGIN UNDER SAFEGUARDING OF INDUSTRIES ACT.

With reference to the article in Weekly Bulletin No. 925 (October 14, 1921, pages 677-8), respecting the Safeguarding of Industries Act of the United Kingdom, exporters are reminded that in order to enjoy exemption from the duties provided for in this measure, the necessary evidence must be produced that the goods in question are consigned from, and grown, produced, or manufactured in the British Empire. The exemption is allowable on the same conditions as imperial preference in respect of other customs duties. Firms not already in possession of the form of certificate required for obtaining the preferential tarill may secure same on application to the Director, Commercial Intelligence Service, Ottawa.

NO TIME TO QUIT.

"The man who once most wisely said,
'Be sure you're right, then go ahead,'
Might well have added this, to wit—
'Be sure you're wrong before you quit.'"

An impatient customer in a confectionery store rapped sharply on the counter.

"Here, young lady," she called, "who waits on the nuts?"

Some people grow under responsibility, others merely swell.—Hubbell.

No one ever yet "lied out" of a difficulty without lying into a worse one.

The Manufacture of Paper

Arthur Morris, a 13-year-old high school boy of Erie, Penna., recently made a trip through the Hammermill Plant in the personal charge of C. D. Kilgore, of the office of the General Superintendent, and as he seemed to have an unusual grasp of what was being done, he was asked by Mr. Obermanns to make a report of his trip. He wrote the essay below after he was at the mill and it is one of the best descriptions of an intricate mechanical process that has come to the attention of the *United States Paper Maker*.

Paper may be manufactured from wood or rags. Wood is the most plentiful and the easiest to get. Spruce is used, but to become high grade paper it must go through many processes.

First the logs are cut by circular saws into lengths of two feet for convenience. As the bark of the logs makes unclean paper, the bark must be removed. This may be done by two ways: By making the logs go through a trough, rolling or rubbing against each other. This trough has running water to loosen the bark. Another way is by putting the logs in a large revolving cylinder which also has water running through it. When the logs come from these two pieces of machinery, they are ready for the next step.

Then they go by means of conveyors to the inspection-room, where the decayed wood is taken out and the large knots are removed. Then the logs go to the chippers (on conveyors); where they are in at an angle, and the knives on a revolving circular piece of metal chip the logs into chips inside of a minute. Here another conveyor takes them to the chip screens. These chip screens allow only the chips that are small enough for the digester to go through them. Those that are too large are chipped again to save wasting.

From these screens they go to the digesters and are emptied into these. When the digesters are full of chips, bi-sulphite of calcium, the acid used for taking out all materials but cellulose, which is the only part used for paper, is poured into the digesters. When they are full of acids and chips the top is placed on and the steam, which is used for heating, is turned on. The chips of wood are cooked for twelve or thirteen hours, and the wood is now called wood pulp. It has a pinkish color and has many pieces of uncooked wood, and also contains much dirt.

The pieces of uncooked wood and the dirt must be removed. This is done by passing the pulp through water, but it is not clean enough to make high-class paper. To be sure to get it clean, the pulp is sucked through bronze plates which have very small slots in them. When the wood pulp comes through here it is ready for the next process.

As it has its pink color, which will not do for white paper, it must be bleached. This must be the next process. The pulp is run into large tile troughs and when these are full a certain amount of chlorine is added. Then the pulp is pushed around until it becomes pure white.

Then it is poured from the troughs into the beaters and dye is added. Rosin and soda are also added to size the paper, that is to make it take ink. A small quantity of blue dye is added—as blueing to clothes—to make it the purest white possible. Then the mixture is beaten by bronze bars in the beaters, and from there it goes to the Marshalls or the Jordans, which are refined beaters.

From this room it goes to the paper room, where it is dried and rolled out into flat sheets. First a large felt belt revolves and just touches the pulp, so that it is picked up. Then it goes through several presses, some having steam inside to heat and dry the paper. It also has the watermarg put on while the paper is still damp. Then it goes through the calender, which makes it very smooth. It is rolled up and taken to the finishing room, where it is cut into the required sizes and is pressed into the different fnishes by means of linen—linen finish—and a rough paper board—ripple finish.

From here it goes to the packing room, where it is put up in packages ready for shipment to different parts of the world.—*United States Paper Maker.*

REDUCE PULPWOOD DECAY BY PROPER STORAGE.

Wood storage conditions at pulp mills are the primary causes for pulp losses as high as 400 pounds per cord of wood, and inestimable losses through poorer quality of paper. Recent investigations by the U. S. Forest Products Laboratory, Madison, Wisconsin, have shown that the wood yards of many mills are littered with rotting bark and debris which serve as sources of infection for the fresh wod. Pulp wood is generally piled directly on the ground, which is usually poorly drained and overgrown with weeds, thus preventing the necessary circulation of air. The wood is not used in rotation, and some of it remains in the piles for several years. These conditions must be corrected before the mills can expect to control the decay problem.

The chief points recommended by the laboratory in reforming the present practice of pulpwood storage are:

Ship pulp logs as soon as possible after cutting, to prevent their lying in the woods where high moisture content and growing vegetation tend to cause infection and decay.

Peel logs, if possible, as this prevents borers from attacking the wood, and also hastens air drying.

Drain and care for storage yards, so as to reduce the soil moisture as far as possibly;cut weeds to permit better ventilation. Filling in the yard with cinders will give good drainage and keep down weeds. The yard should never be placed on barker waste.

Do not rick wood directly on the ground. The best procedure is to pile it on stringers supported by concrete piers or creosoted wood blocks. The stringers should be pressure-treated with coal-tar creosote. The piers or blocks should be high enough to raise the stringers at least 12 inches off the ground to allow for ample ventilation.

If ground is available, pile so that the full length of the pile is exposed to the prevailing winds. Never place the piles less than three feet apart.

Mark each pile of logs with the date it was received and, if possible, the age of the wood. Use up the wood in rotation.

Upon removal of a pile of wood, clean up the debris and burn it, lest it become a source of infection for new wood. All infected skid logs should be removed.

Where timber is placed in conical piles by conveyors, a possible remedy may be to keep the wood saturated with water by means of an overhead sprinkler system delivering the minimum amount of water necessary to keep the surface of the pile wet. Wood saturated with water will not rot because there is not enough air within the timber to allow the fungi to grow. Whether it is commercially possible to wet the piles down sufficiently and maintain them in this condition must, however, be demonstrated by actual test.

(See also Pulp and Paper Magazine, Dec. 12, 1920, p. 1225.)

Export Packing

By C. C. MARTIN, National Paper & Type Co.

Doubtless the reluctance to consider duly and justly the expert packing problem is the result of the fact that the popular imagination conceives this to be a problem of amazing simplicity, and we fear that the same imagination looks upon the subject as a mechanical one, restricted in its skill and craftsmanship to the carpenter's saw and the carpenter's hammer. Yet what we need most emphatically is a reformation of this popular imagination, for a man who is competent in the matter of export packing is one of the best educated individuals in export trade. This man would have to know a great many things, of which the following are a few:

Our expert must be fundamentally informed on the subject of tariff laws and transportation conditions, both maritime and terrestrial, throughout the world; he must know a good deal about stowage and the mechanics of shipping, and must not be in doubt regarding landing problems in different ports, methods of handling goods, and commercial practices throughout the world; his must be a highly developed and sufficient knowledge of different woods and the technique of case and box construction; familiarity with waterproofing methods and varied practice in the protection of commodities must be required, as well as expertness in the matter of the holding power of nails, center of gravity of shipments, reduction of cubic displacement and so on. Our expert must also be informed about marine insurance, for he must know when to insure against special risks and when not, and he must be acquainted with the niceties of particular average. The varied knowledge that has been advised as a requisite in this circumstance is not an exaggeration, but is merely a superficial statement of what the men in our packing departments should know and what they will know eventually, when we can with confidence and truthfulness say that we are prepared to pack our goods with that excellence and sufficiency which has characterized the work of certain of our foreign competitors.

One of the most important things in the matter of export packing is to follow strictly the instructions of the consignee. If these were followed, a large proportion of export packing failures would cease to exist; and if the instructions regarding marks, division of the contents of the packages, and so on were obeyed, the problem would be greatly simplified. The wrong marks or incorrect marks may cost your consignee a great deal in lost time and money, it may even lose him the shipment; wrong numbers may cost a fine in the custom house of 25 per cent. of the duty; plastering the case with all sorts of advertising matter that indicates the contents of the case may cost the marine insurance company a great many thousands of dollars for losses due to pilfering; while instances of goods packed in heavy containers for countries where duty is levied on the gross weight, or cases of goods packed in fragile and light containers where duties are levied on the net weight are too common and too discouraging to be mentioned.

The metal strapping of export boxes is a prime factor; practically all export cases, no matter what their size, weight or destination, should be metal strapped, for properly applied strapping greatly increases the strength of the contained and is also of material assistance in preventing pilfering. Waterproofing is a science in itself and, contrary to the general understanding, it may be said that a tin-lined case does not always guarantee by any means that the goods are protected from moisture.

No discussion of export packing would be complete without mention of the Forest Products Laboratory of Madison, Wisconsin, for the work that the laboratory has done in experimentation and research has been of incalculable aid in the advancement of the science of export packing. During the war the laboratory saved the Government millions of dollars by redesigning packing cases for overseas shipments, and the co-operation the laboratory offers the public in the matter of solving packing problems cannot be too highly praised. All good friends of this branch of the Forest Service of the U. S. Department of Agriculture were more than pleased to receive a card from the director a few days ago stating that Congress had increased the laboratory appropriation some $100,000. Truly a well-merited recognition of worth and accomplishment.—The World's Markets.

THE PAPER INDUSTRY IN CZECHO-SLOVAKIA.

The Department of Commerce is in receipt of a report on the paper industry in Czecho-Slovakia. In part, the report says:

"In the years immediately preceding the war the paper industry of Bohemia had been highly developed and was forming a large part of the total output of Austria-Hungary. Thus, in 1908, the lands which are now in the Czecho-Slovak State produced 164,740 metric tons of paper, having a value of about 329,000,000 crowns. At the same time the total production of Austria-Hungary was 316,910 metric tons, with a value of about 724,000,000 crowns (about $146,972,000 at par value of the crown, $0.203).

"At present there are fifty-eight paper mills in the country, with a total annual capacity of 226,000 metric tons. The present value of that amount of paper is about 1,582,490,000 crowns (about $36,400,000 as current exchange rates). The tremendous rise in these figures, as expressed in crowns is, of course, to be accounted for by the fall in the value of the crown. The total annual consumption of domestic industries and trade is 154,420 metric tons. The remainder, 71,580 metric tons, is available for export. German Austria now has forty paper mills, producing 153,000 metric tons yearly, and Hungary one mill, with an annual capacity of 3,460 metric tons.

"Most of the paper made in Czecho-Slovakia is print paper, but other grades are manufactured. Last year, 3,000 tons of parchment paper were made, all of which was exported. There was also an output of 4,000 tons of cigarette paper, 90 per cent of which was exported."

A. A. A. S. HONORS CANADIANS.

At the annual convention of the American Association for the Advancement of Science and affiliated bodies at Toronto last week, Canada was honored, not only by the presence of such a distinguished organization, but also by the election of several Canadians to important offices. Prof. James P. McMurrich, of the Department of Anatomy, University of Toronto, was elected president of the Association; Prof. W. Lash Miller, University of Toronto, is chairman of the Chemistry Section; and Prof. Francis E. Lloyd, of McGill University, whose article on Cereal Straws appeared recently in the Pulp and Paper Magazine, is chairman of the Botany Section.

The man who decides to hold off until things improve may find, when things improve, that the man who held on and helped them to improve is so far ahead that he can't be caught.—Vision.

BROMPTON BALANCE SHEET.

The annual statement of the Brompton Pulp and Paper Company shows an appreciable decrease in earnings which, after deducting expenses, insurance and income tax is set at $1,097,784 as against $1,853,588 a year ago. Deduction for depreciation, bond interest and preferred dividends left a balance of $498,010, which is equal to a return of slightly over 7 per cent on the comon stock. This compares with 9.57 per cent a year ago and 9.8 per cent for 1919.

An outstanding point in the statement is the large amount written off for inventories, which according to a director, brings them down to current market values. Inventories are set at $3,130,931, and from these is deducted $944,964 to allow for the shrinkage in values. The report of the directors points out that in May last the issue of $2,500,000 eight per cent convertible sinking fund bonds was issued to re-imburse the company in part for amount spent on plant and property, and that improvement in sales and in the company's financial position made it possible to restrict this issue to $1,750,000, at which figure it now stands.

The profit and loss statement shows that after allowing for the heavy writing off of inventories there is carried forward a balance of $811,625, which is compared with $1,643,579 at the end of the previous year. It should be noted that but for the generous allowance on inventories, the balance at profit and loss would have shown an increase over that of a year ago.

The balance sheet shows a satisfactory preponderance of assets over liabilities. Outstanding features are the increased values of the properties from $8,878,597 to $11,001,824, and an increase in the company's investments from $1,721,418 to $2.116,792. These are understood to represent the Groveton and Claremont properties which form a valuable outlet for the products of the Brompton plant. It is also stated that the parent company's equity in these properties will be $2,000,000 more than appears here, and will appear in next year's consolidated balance sheets.

Among the liabilities, the company's issued bonds are shown at $3,913,000 as against $2,193,000 a year ago, the difference being made up by the issuing of $1,750,000 eight per cent convertible sinking fund bonds, as above referred to. The accounts payable are increased from $761,051 to $1,229,995, and much of this increase is stated to be made up by amounts due on land and machinery purchased which will appear in next year's assets. Pay rolls and taxes amount to $547,138 as compared with $580,234, and an important item is the appearance of bank loans to the extent of $875,000. There is also a balance of notes due for land purchases amounting to $229,000 which does not appear in the statement of the previous year. Dividends payable are set at $40,000 as against $280,000 a year ago.

The company is making extensive preparations to cut wood this year. Its present supply will carry it until February, 1923, but in the meantime advantage is being taken of the low rates at which it can be cut and stored this year.

It is proposed that the fiscal years of the company and its subsidiaries will be made to coincide, so that a consolidated balance sheet and profit and loss statement may next year be issued.

The reward of a thing well done, is to have done it.
--Emerson.

SIR FREDERICK BECKER.

Sir Frederick Becker, who was the recipient of the honor of knighthood in the New Year's list, is widely known in pulp and paper enterprise, and enjoys an international reputation. In addition to his large pulp and paper interests with offices in London, Paris, New York, Milan, Montreal, Halifax, N.S., Madrid, Lisbon, Hamburg, Christiania and Stockholm, as well as in South America and the Far East, his company is represented by agencies in practically every country in the world. Sir Frederick controls by far the largest group of paper mills in Great Britain, consisting of fourteen, with a combined output of 1,000 tons a day, and he is also chairman of another independent group of ten paper mills. His organization includes a fleet of four ocean-going steamships.

Sir Frederick Becker.

Sir Frederick Becker is, however, chiefly known in Canada by his interest in Canadian wood pulp and wood pulp mills. Among those in which he possesses a substantial interest are: Ha Ha Bay Sulphite Company, Sissiboo Pulp Company, N.S., Clyde River Pulp Company, N.S., as well as the Chicoutimi Pulp Company and the St. Lawrence Pulp & Lumber Company.

Sir Frederick Becker is himself either chairman or vice-chairman of 27 different companies, and is also represented on many directorates upon which he himself has no seat. Closely associated with him in business are Mr. Stanley Cousins, on matters pertaining to paper, and Mr. G. R. Hall Caine, on matters pertaining to wood pulp.

He was fifty years of age on December 30 last, is an indefatigable worker, his only recreation being shooting and fishing on his Scottish estate. He has four residences, Sutton Hall at Hounslow, near London, Ellon Castle in Scotland, Don Cottage, Aberdeen, and Clondalkin, near Dublin. He is also a member of the Carlton Club, London. His Montreal office is at 164 St. James Street, in charge of Mr. A. M. Irvine, a director of Becker & Company of America.

CANADA'S BIGGEST POWER UNIT.

Completion of the two and one-half mile Chippawa-Queenston channel by the Ontario Hydro Commission brings water power development at Niagara Falls over the threshold of 1,000,000 horse power, equivalent in steam-generated electricity to a coal consumption of more than 10,000,000 tons a year. The mighty cataract long one of the wonder sights of the world, has become the world's greatest centre of hydro-electric power.

Dredges which have been cutting through earth and rock north from Chippawa and south from Queenston for three and a half years in a wide swing about the falls, were removed last month. They have taken out 13,200,000 cubic yards of earth and 4,182,000 cubic yards of rock, a total slightly more than the French had removed from Culebra Cut at the time the Panama route was taken over by the United States. The maximum depth of the Chippawa ditch is 145 feet and at one point the engineers were confronted with a rock cut of 85 feet in depth. They also had to change the course of Chippawa creek. Its natural course was southerly into the Niagara, while the completed canal will flow northerly.

The Chippawa-Queenston canal cost about $65,000,000. An additional $15,000,000 will be required to complete installation of the 10-unit generating machinery.

The output of the super-power plant will be 650,000 horse power. There are now three plants operating on the Canadian side of the river with a total output of 450,000 horse power, so that if all of them are continued in operation, Canada's Niagara production alone will be over 1,000,000 horse power mark.

Existing and projected development on the American side has a potential production of 420,000 horse power from upper river diversion. The Niagara Falls Power Company, in control there, has other hydroelectric and steam plants giving it a total marketable output of 610,000 horse power, but from Niagara river alone the production is 420,000 horse power.

The reaching and passing of the million horse power mark has been accomplished in approximately a quarter of a century, for it was in 1895 that the wheels of the first industrial plant at Niagara Falls were turned by hydro-electrical energy. The first turbines on the Canadian side were installed ten years later.

Power development on the Canadian side has been under Government control, while on the American side it has been largely in the hands of one corporation. Canada's power has been scattered over a wide field, serving many municipalities within a radius of 250 miles with current for light, heat and power. The policy on the American side has been to concentrate users of power at or near Niagara Falls. Buffalo and cities as far east as Syracuse get sufficient power from Niagara Falls to run street cars and for a few industries, but the bulk of power is used within a short distance of the generating plants.

EGYPTIAN IMPORTS OF NEWSPRINT.

Norway and Sweden appear to have the chief place in Egyptian paper markets. Newsprint, for instance, in 1920, came from the following sources:

Sweden	1,099 tons
Norway	964 "
England	208 "
Italy	183 "
Other countries	396 "

Moniteur de la Papeterie Francaise, September 1, 1921.

CANADA'S 1921 TRADE SHOWS BALANCE GAIN.

Canada's trade during the past year has been on an improving scale, a falling off in volume. Figures issued by the Dominion Bureau of Statistics covering the twelve months to the end of November show the Dominion with a favorable balance of trade amounting to $55,231,963 as against an unfavorable balance of trade for the same period a year ago of $56,055,850. Total exports in the year amounted to $880,458,548 against $1,289,536,450 in the 1920 period, and total imports were $825,226,585 against $1,345,592,300.

The figures for the twelve months to the end of November compare with a year ago as follows:

To Nov . 30	1921	1920
Exports	$880,458,548	$1,289,536,450
Imports	825,226,585	1,345,592,300
Excess exports	$55,231,963	*$56,055,850

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*Excess imports.

In the twelve months Canada imported goods from the United Kingdom to the value of $123,802,142, and from the United States $597,427,941. Exports to the United Kingdom were valued at $305,317,708, and to the United States $359,016,167.

SALE OF PAPER MILLS.

The Gibbs-Brower Co. announce the sale of the Windsor Locks Paper Mills, Inc. of Windsor Locks, Conn. for Mr. Norman N. Fowler to the J. L. N. Smythe Co. of Philadelphia, Pa.

The Fowlers of Holyoke and Springfield, Mass., have long been known in the paper mill world, and Mr. Smythe and his associates have likewise been active in the paper jobber's field for many a moon. Both parties enjoy an enviable reputation in the trade, and the transfer of this Paper Mill is of much interest to the industry in general.

Mr. Wm. S. Fowler has been operating the Windsor Locks Mills and will retire to accept a responsible position in one of the large Holyoke mills.

Mr. C. H. Morian, General Manager of the J. L. N. Smythe Co. will also be General Manager of the newly acquired mill. Mr. Morian is a very able man and has a complete knowledge of the manufacture of paper, having been brought up in the paper game in the mill of the Racquette River Paper Co. at Potsdam, New York. All of his friends wish him every success in the new enterprise, and if he repeats his customary achievements, it will be some mill!

The J. L. N. Smythe Co. expect to spend a considerable amount of money at once in revamping the equipment, and shall continue to operate the mill on crepe tissue toilet and towel papers.

SUCCESS.

The father of Success is Work.

The mother of Success is Ambition.

The oldest son is Common Sense.

Some of the other boys are Perseverance, Honesty, Thoroughness, Foresight, Enthusiasm, Co-operation.

The oldest daughter is Character.

Some of her sisters are Cheerfulness, Loyalty, Courtesy, Care, Economy, Sincerity, Harmony.

The baby is Opportunity.

Get acquainted with the "old man" and you will be able to get along pretty well with the rest of the family.
—Ex.

PULP AND PAPER NEWS

Mr. G. Meerbergen, who recently resigned as Superintendent of Production with the Belgian Industrial Co. to establish a business of his own in Belgium, has sufficiently recovered from his operation to return from the hospital. He expects to sail for "home" from Halifax on the 9th.

The Department of Lands and Forests of the Province of Quebec has issued a calendar for the year 1922 which gives, pictorially, a lesson in the extent and importance of the forests of the province and the necessity for their protection in order to maintain the industries dependent thereon. Especial emphasis is laid on the terrible effects of forest fires.

In the Toronto elections it was of interest to note that among the defeated candidates were four printers and publishers and four journalists. One printer and one journalist were elected to the Board of Aldermen, and two journalists, one printer and one writer were elected to the Board of Education.

A visitor to Northern New York last week found things quiet, but showing signs of improvement. One news mill had all it could do and orders ahead. There seemed to be a general slackness of work in machine shops.

The extension of the Sherbrooke Machinery Company, manufacturers of pulp and paper machinery, entailed an expenditure of $100,000, enabling the company to double its production and employ about 100 men.

The following Christmas greeting by Mr. L. M. Smith, assistant manager of the Brompton Pulp and Paper Company, is a model of its kind. It is brief, encouraging, and permeated with the co-operative spirit which makes for success: "In the pulp and paper industry we find a period of very keen competition for a sub-normal amount of business, an intensified battle for the highest quantity for the lowest price, and to this end the management asks for the help, co-operation, and constructive criticism of all members of the organization. A chain is no stronger than the weakest links. It is the duty and should be the privilege of all members of our organization to make his or her link stronger each succeeding year than during the preceding one, and in so doing make the Brompton chain stand the test for all time. At this time the management wishes to extend to the employees, customers, and friends the sincere wish for a Merry Christmas and a Happy and Prosperous New Year."

Mr. D. F. Robertson, general manager of the Canadian Paperboard Company, Limited, Montreal, spent a few days in Toronto.

Sir William Price and Mr. H. Biermans were recent visitors at Grand 'Mere.

A Glasgow papermaker's agent and merchant desires to secure an agency for a Canadian paper mill. This firm has branches in Edinburgh, London, Newcastle, Bristol and Johannesburg. (Particulars from Department of Trade and Commerce, Ottawa).

If you have done something that is good, forget it and do something better.

PROVINCIAL TO PROCEED AT PORT ARTHUR.

Port Arthur, Ont., January 2.—The industrial outlook was further improved to-day when the ratepayers by a vote of more than ten to one, ratified an agreement made by the City Council with the Provincial Paper Mills, Limited, whereby the company agrees, in return for fixed assessment and other minor concessions, to commence at once the construction of an addition to its pulp mill here, a paper mill to cost about one million dollars and employ some five hundred hands.

It is expected also that the manufacture of much of the paper machinery, which will cost some $600,000, will be done by the Port Arthur Shipbuilding Co., which have recently been fitted up for that work, this giving employment to a large force for about eighteen months.

OPPORTUNITY IN BOARDS OR BOXES.

A branch of South African trade which has recently made great progress is the exportation of fruit. The fruit, we learn, is at present packed for export in wooden trays or boxes made as a rule from imported timber at considerable expense. The idea has, however, been mooted that these trays could be made from pressed paper boards, such as are now used for boxmaking and many other purposes in this country. The boards could be exported to South Africa in bales for manufacture there, or it might be possible to export made-up collapsible trays or boxes to meet the requirements. There is probably a big opening in this direction for British firms able to provide the right article on the right terms.—World's Paper Trade Review.

N.B.—Get boxboards made in Canada.

PRESENTED WITH A WATCH.

T. J. Ellis, Superintendent of the International Paper Co.'s plant at Three Rivers, was pleasantly surprised last week when at the closing of the mill for the Christmas holidays, the employees of the Sulphite Mill presented him with a handsome gold watch and chain. Mr. Ellis gave a short talk to the men, expressing his thanks for their thoughtfulness in his behalf and in commenting upon the splendid spirit shown by them during the past year, during a time when the loyalty of the company's employees was of such vital moment, said, that with a continuance of such co-operation, he was assured of the future success and prosperity of the mill.

EXPEDITE PAPER SHIPMENTS.

The railways are continuing to give special attention to the expedition of newsprint paper shipments. For example, eight cars left Shawinigan Falls at 6 p.m, on December 23, over the Canadian National Railways, shipped by the Belgian Industrial Co., Limited, to the New York Sun-Herald, and were delivered by the New York Central at Pier 34, New York City, on the 27th. This is excellent time, particularly in the holiday season.

Technical Section

REVIEW OF RECENT LITERATURE.

A-7. Sulphur in Pyrite Ash. SIEBER. **Zellstoff u. Papier,** i, 75, (June 1921). The percentage of sulphur determined by the Lunge-Stierlin method and by the Lest method was found to be approximately the same. The former method has been shortened by Sieber who used a Buchner funnel when washing the precipitate. -H. E. W.

A-12. The World's Production of Rosin. ANON. **Zellstoff u. Papier,** i, 118, (July 1921). The figures for the production of rosin in America, France, Spain, Portugal, Greece, Russia and Finland are given. Germany is the greatest consumer of rosin.—H. E. W.

A-12. New Rosin Constituents. ASCHAN. **Zellstoff u. Papier,** i, 103, (July 1921). The article contains a historical account of recent work done on rosin. Various chemical reactions shown by rosin are mentioned. -H. E. W.

A-14. Glarimeter. KIESER.. **Zellstoff u. Papier,** i, 113, (July 1921). Mention is made of an instrument made by Schmidt and Haensch which has been used to measure the blackening of photographic papers on exposure to light, the degree of whiteness of papers, and to measure color as a function of the black content. Cuts are given showing the use of the instrument as a glarimeter and as a "blackmeter" for testing the whiteness of paper. -H. E. W.

A-15. Reducing Power and Solubility of Oxycellulose. SCHWALBE and BECKER. **Zellstoff u. Papier,** i, 100, (July 1921). Characteristic differences between hydrocellulose and oxycellulose were sought. Oxycelluloses made from cotton and from wood cellulose (intended for nitrating purposes) by means of bleach, and from cotton by means of permanganate and peroxide, and hydrocelluloses made from cotton by the Girard and the Lederer methods were tested for ash, furfural, alpha-cellulose and baryta-resisting cellulose contents, as well as for barium assimiliation, corrected copper number, hydration copper number, acidity, alkali of ash, and color with iodine-potassium iodine.—H. E. W.

A-15. Cellulose and Sulphite Pulp. KLEIN. **Paper Trade J.,** lxxiii. 46, (Sept. 8, 1921). The author mentions various constitutional formulas of cellulose, including those proposed by Green, Cross and Bevan, Tollens, Hess, Vignon, Hibbert, and Herzog, and emphasizes the fact that cellulose is a colloid. Soluble lignin compounds result from esterification, by condensation of the bisulphite with carbonyl groups, by addition of the bisulphite to a double bond, and by sulphonation. Sulphite pulp is a cellulose rich in residues of the decomposition of wood. H. E W

B-0; K-15. Waste Wood in Paper Making. CLARENCE J. WEST, National Research Council. **Paper Trade J.,** lxxiii. 52, (Sept. 8, 1921). Forty to 50 percent of the wood is wasted at the mill approximately as follows: bark 10-12 percent, sawdust 12-15 percent, edging and trimming 15-20 percent, careless manufacturing 5 percent. A furnish for news print of 30 percent sulphite 35 percent waste paper, and 35 percent sawdust pulp is given.—H. E. W.

D-4. Grinder Regulator. Ger. patent No. 335,504. Class 55c, Blank. When the number of pockets working is reduced the stone speeds up on account of the reduction in the load. The increase in speed is made to open a valve which exerts greater pressure on the piston.—H. E. W.

D-4. Improved Grinder. Ger. patent No. 328,891, Class 55a, Hall Process Co. The stone has grooves into which the ground wood sinks and the fibers are not shortened after grinding. The grooves are 3 mm. deep and 18 mm. apart.—H. E. W.

D-4. Wood Grinder. EMIL SCHERRER, Landquart, Switzerland. Ger. patent No. 338,767, Class 55a. A wood grinder with water pressure operated press cylinders is described. Water is pumped into a cylinder and pressure is exerted against a piston which is connected with a shaft to be a second piston in contact with the wood. When the wood which has been charged has been ground, a cock is turned by the operator and water then flows into the other chamber of the cylinder, forcing the piston back. A new charge is add, the cock is turned back to its initial position and the operation is repeated.—H. E. W.

D-4. Paper from Hall Process Ground Wood. ENGE. **Wochbl. Papierfabr.,** lii, 2758, (1921). The article gives a description of a sample of paper made from Hall process ground wood and 10 percent sulphite.—H. E. W.

D-5. Half Stuff from Wood. Ger. patent No. 324,053, Class 55b. TRYGVE KITTELSEN. The wood is first cooked with black liquor, and then fresh liquor is added and the wood is finally ground.—H. E. W.

D-0. American Ground Wood Production. KLEIN. **Wochbl. Papierfabr.,** lii, 2593, (1921). The author mentioned the success of the Hall process for ground wood in America. He gives data showing that wood ground by this process replaces satisfactorily sulphite pulp.—H. E. W.

E-2. Improving the Tanning Power of Ligninsulphonic Acid. HINTIKKA. **Zellstoff u. Papier,** i. 102, (July 1921). Acids isolated by the Fuchs and Honig method (Monatsh. fur Chemie, xxxix, 1, (1918) in water were precipitated by hydrochloric acid and it was found that the amount taken up by hide powder increased when air was blown through the solution. The increase noted by those authors when baryta water was used in the process of tanning is attributed to an oxidation effect. H. E. W.

E-0. New Developments in Sulphite Mills. KUHN. **Zellstoff u. Papier,** i, 109, (July 1921). Among other recent innovations in the equipment lately installed in sulphite mills, the Brunger-Deissler cooker is mentioned, and with this digester samples of cooked wood are taken out of the digester and inspected. The waste liquor is not tested.—H. E .W.

F-5. Preparation of Pulp from Straw and Bamboo with Soda. PASCHKE. Ger. patent No. 340,338, Class 55b. The patent covers the use of sodium carbonate as a reduction agent, the soda being recovered by means of calcium carbonate and sodium sulphate as in the LeBlanc process.—H. E. W.

G-8. Metal Cloth for Dewatering Machine. POHLE.

Ger. patent No. 332,458, Class 55d. Double drilled metal cloth.—H. E. W.

G-8; K-12. Press Roll. Aktiebolaget Fekaniska Verkstad in Karlstad, Sweden, Ger. patent No. 338,700, Class 55d. At the bottom of the grooves in the roll are small ridges, which aid in removing the expressed water. The major ridges do not touch the smaller ones.—H. E. W. (Also, Can. patent No. 192,890, Sept. 23, 1921).

G-0. Drum Filter and High Pressure Press for Dewatering Cellulose. WIHAN. **Wochbl. Papierfabr.** lii, 3094, (1921). A description of these two dewatering machines is given and details of their operation are discussed. A high pressure turns out a product of 54 percent dry content and the saving in fuel which their use involves is mentioned.—H. E. W.

K-6; K-18. Oat Hulls for Straw Board and Paper Pulp. S. D. WELLS, Forest Products Laboratory, Madison, Wis. **Paper Trade J.**, lxxiii, 40, 42, 44, 46 (Nov. 3, 1921); **Pulp and Paper, 19,** 1139-1143, (Nov. 10, 1921). Over 1500 t. of oat hulls are available daily. Lime containing magnesia was used in one cook, straight lime in another, lime-sulphur in a third, and the sulphate process for the fourth. The lime-sulphur process gave unsatisfactory results. In the sulphate process the fibers were short and could not be washed easily because they were slimy. Two cooks were made in which the straw was mixed with cotton linters with a view to counteracting the extreme softness and fluffiness of linters with the hard dense nature of straw pulp. Results show that the greatest factor in using oat hulls for board is the beater treatment. The best cooking conditions were found to obtain when 11.6 percent lime was used as the reagent at 136°C for 6 hrs. Oat hulls may replace straw in straw board with satisfactory results. The cost of converting hulls into fiber is no greater than the cost of converting straw. The bursting strength of sheets made from hulls is less than that of sheets made from straw, but mixture give higher tests than either alone. The results of several cooks are given. –H. E. W.

K-7. Contrivance for Beaters. Ger. patent No. 338,-011, Class 55c, ECKER and ROTH. A partition working in grooves is set before the beater roll. The partition can be raised or lowered to regulate the flow of stuff to the beater roll.—H. E. W.

K-10. Sizing for Paper...Ger. patent No. 331.742, H. TH. BOHME. A mixture of montan wax and coumarone rosin is mixed with sulphite waste liquor and used for sizing.—H. E. W.

K-10. Starch Sizing for Paper. Ger patent No. 322,-936. The Casein Co. The starch is treated with oxalic acid.—H. E. W.

K-10. Sizing for Paper. Ger patent No. 303,341. ZANDER. Montan wax is saponified with soda and then emulsified.—H. E. W.

K-10. Sizing for Paper. Ger. patent No. 331,742, H. The sizing is effected in the beater with crude montan wax and sulphite liquor or with coumarone resin and sulphite waste liquor.—H. E. W.

K-10. Sizing Paper with Bakelite. Ger. patent No. 338,395, Holzverkohlungs-Industrie Akt. Ges. Translation by CLARENCE J. WEST. **Paper Trade J.**, lxxiii, 52 (Oct. 13, 1921). Alkaline solutions of phenol-formaldehyde resins added to paper pulp yield with alum a resinous material suitable for sizing. Small amounts only are needed; 1-2 parts of phenol resin to 100 parts of pulp are mentioned.—H. E. W.

K-10. Sizing with Water Glass. Ger. patent No. 338,396. Translation by CLARENCE J. WEST. **Paper Trade J.**, lxxiii, 52, (Oct. 13, 1921). Water glass gives good results in sizing if used with some other sizing agent such as bakelite.—H. E. W.

K-10. Silicate of Soda in Paper Making. JAMES G. VAIL. **Paper**, xxix, 9-11, (Oct. 26, 1921); **Paper Trade J.**, lxxiii, 32,34 (Oct. 27, 1921); **Chem. Met. Eng.**, xxv, 823-824, (Nov. 2, 1921). Failure to neutralize the soda in waterglass by alum will cause injury to the rosin size. The precipitated silica contains aluminium silicate, aluminium hydroxide, and hydrated silica. Sodium silicate differs from rosin in that the precipitate does not form as soon as alum is added. From dilute solutions the precipitate is flocculent, but from concentrated solutions it is granular and lumpy. Results of large scale experiments are given. The order of adding the materials is : silicate, alum, rosin size, clay, alum for the rosin size. The advantages to be secured by using silicate are given.—H. E. W.

K-12. Electric Drives for Paper Machines. STRAUCH. **Wochbl. Papierfabr.**, lii, 2505, (1921).—H. E. W.

K-12. Development of Paper Machinery Construction. KLEIN. **Wochbl. Papierfabr.**, lii, 2425, (1921). An account of the developments in paper making machinery which make high speeds possible.—H. E. W.

K-14. Paper Cutter. A. TRAUBE. Ger patent No. 338,769, Class 55e. The paper is cut by a wire hung under the moving web. The wire is slack and is fastened at both ends. A moving rod passes over the machine and at right angles to the machine direction, and carries the wire through the sheet.—H. E. W.

K-15. Wall Paper. RABE. Ger. patent No. 331,859, Class 8n. China clay is colored with a high percentage of aniline dyes and mixed with an adhesive and is printed or used as a coating on paper.—H. E. W.

K-18. Manufacture of roofing boards. Pappen u. Holztoff-Ztg., Nos. 44 and 45, (1920). The modern mill should have in conjunction with board machines a special type of boiler for the production of tar. and, in addition, a drum for sorting and reducing the sand to a uniform grade. The raw board is carried on a felt through 3 or 4 press rolls in succession. Very good results have also been obtained by tarring the board on the Fourdrinier machine.

K-19. Coating for Paper. Ger. patent No. 336,694, Class 55f, RAFSKY. Ball-milled lime mud with an alkaline solution of casein is used for coating paper.—H. E. W.

K-23. Production of Imitation Hand Made Paper. Pappers Travaru Industri., No., 2, (May 15, 1921). Although the manufacture of this paper is not difficult, modern paper machines are not adapted to this purpose. The best grade is made on the cylinder machine by an Italian firm. It has a width of about 1.5 m. The pulp is conveyed through two sand tables placed opposite each other, and thence over a rust-free copper plate to the cylinder where the sheet is formed. —P.B.

K-23. Paper with High Electrical and Mechanical Resistance. T. E. BLASWEILER, Ger. patent No. 338,334, Class 55f. Paper for packing hygroscopic chemicals for overseas shipment is described. Pitch is sprayed or spread on one side of a sheet of paper and then the sticky sides are placed together and the paper is calendered.—H. E. W.

British Trade News

(From Our London Correspondent.)

London, Dec. 22, 1921.

It has now been decided that the luncheon to be given on the eve of the new year to Mr. F. E. R. Becker, of Messrs. Becker & Co., Ltd., the agents for several Canadian pulp mills, will be presided over by Viscount Burnham, of the London "Daily Telegraph." The luncheon is to celebrate Mr. F. E. R. Becker's 50th birthday and his large circle of friends in the pulp and paper trade are presenting him with an oil painting of himself. Mr. Becker is very popular in London and in connection with Sir E. Shackleton's expedition to the South Sea Islands, in the "Quest," he contributed handsomely toward the scientific equipment.

Pulp Men Meet.

The members of the British Wood Pulp Association held their 25th annual meeting in London on the 15th inst., Mr. S. Nicol, in the chair. The report was short. It stated that two members had resigned and one member had been elected. Then the much discussed and thread-worn contract note was referred to in the following terms: "Your committee has given thorough and continuous attention to this matter. A conference has been held with the Papermakers Association at which considerable progress was made and the individual views of all members of the committee were obtained in writing for the assistance of the Contract Note Sub-Committee. The question of various amendments has been informally discussed by the chairman of your Committee with the Scandinavian Associations, before whom the complete suggested amended Contract Note has now been placed for consideration, and it is hoped that a conference of all Associations interested may be arranged during the coming year." Dealing with the past year's conditions the report added: "The year under review has been a very difficult one for all concerned with the paper and pulp trades. The hardships caused by the existence of many high priced contracts for large quantities of pulp have led to negotiations between sellers and buyers, which, generally speaking, have resulted in the readjustment of both price and delivery. Communications took place betweeen the Scandinavian Association, the Papermakers' Association and your Committee as to the advisibility of attempting to conduct these negotiations through the various Associations, but after very careful consideration, your committee came to the conclusion that owing to the varying circumstances at the different mills, the question could be settled more quickly and better through individual action, and in this view it was supported by the Scandinavian Associations. Many other questions of interest have come before your committee, but are not such as to warrant individual mention."

Mr. L. P. Andrews was re-elected President. Mr. D'Oyley Mears was added to the list of vice-presidents as a compliment for his past services to the Association. Mr. Eric Nordberg was again re-elected Hon.-Secty., with Mr. G. Westling as Hon. Treasurer. The committee now consists of Messrs. L. E. Rustad, S. Nicol, S. Diesen, H. A. R. Butler, Chas. Greenhalgh, N. Leader, E. C. Lait, W. J. Mather, R. Dickson, and J. A. Nordberg. The members of the Association commented on the serious depression and conditions of the British paper industry—facts which have from time to time been recorded in the "Pulp and Paper Magazine"—and the serious question of selling pulp and paper below the actual cost of production in the mills was also discussed at length.

As announced sometime ago no dinner was decided upon this year owing to the grave condition of trade. It is quite evident the members of the Association have had a most critical year looking for business and trying to overcome difficulties concerning contracts, which papermakers entered into at high prices and from which they subsequently asked forebearance and relief to enable them to meet the paper depression or changed conditions in the markets.

Eleven Months Pulp Imports.

The imports of pulp between January and November of this year have fallen to nearly half of those for the corresponding period in 190. Needless to say, the figures make gloomy reading. But, gloomy as they are, Canada occupies a strong position for groundwood which is most gratifying. The total imports of all kinds of pulp from all supplying countries for the past eleven months reached 513,086 tons, valued at £11,311,029, as against 1,005,486 tons at £26,945,659. These figures tell the story of depression in the paper industry. Imports of groundwood were as follows, November shipments being shown in parenthesis:—

Mr. L. P. Andrews.

Groundwood: From Sweden, 20,143 tons as against 81,174 tons in 1920 (November 1921, 6,835 tons; 1920, 3,678 tons); Norway, 169,573 tons, 283,374 tons in 1920, (Nov. 1921, 22,720 tons; 1920, 19,437 tons; Canada, 113,561 tons, 77,626 tons in 1920 (20,190 tons in Nov.; 4,625 tons Nov. 1920); Other countries, 12,727 tons as against 27,679 tons in 1920 (Nov. 1921, 647 tons; 1920, 2,673 tons). Total: 316,004 tons as against 469,853 tons in 1920 (Nov. 1921, 50,392 tons; 1920, 30,413 tons).

Groundwood (Dry): Imports for the eleven months reach 3,938 tons as against 27,352 tons for the same period in 1920. During November 862 tons were received, an increase of 206 tons over the same month last year.

Bleached Chemical (Dry): From Finland 380 tons, compared with 231 tons in the eleven months of 1920; Sweden, 3,279 tons, as against 4,787 tons; Norway, 8,228 tons, as against 15,460 tons; Germany 273 tons, compared with 525 tons; other countries, 1,172 tons as against 5,531 tons in 1920. Total: 13,332 tons, just half of 1920 shipments. Imports in November were

1,776 tons, valued at £58,655, compared with 2,044 tons at £111,631 in Nov. 1920.

Unbleached Chemical (Dry): From Finland, 11,066 tons as against 37,156 tons in 1920; Sweden, 121,318 tons as against 306,307 tons; Norway, 30,140 tons as against 84,889 tons; Germany 4,957 tons as against 6,980 tons; other countries 10,227 tons as against 35,664 tons. Total: 177,708 tons for 1921 compared with 470,996 tons in 1920. In November 12,976 tons were imported as against 46,479 in Nov. 1920.

Chemical (Wet): For the eleven months 2,104 tons imported valued at £28,696, as against 10,751 tons at £276,013 for the same months in 1920.

Paper Exports and Imports.

Imports and Exports show a decline. A noticeable feature is the drop in November shipments from British mills which does not show a healthy sign. The total imports and exports were as follows:—

	Imports,—Cwts.		Exports,—Cwts	
	11 mths.	Nov.	11 mths.	Nov.
1921	6,046,402	712,308	1,325,641	135,257
1920	12,270,366	821,602	2,111,204	279,516

Fine printing paper was shipped to Canada to the extent of 107½ tons during the period January to November, which is a decrease of 33 tons when compared with 1920. Writing paper was exported to the Dominion in increased quantities, the total to Nov. 30 being 56½ tons as compared with 37 tons in 1920. No newsprint was received from Canada or Newfoundland in November last. The shipments for the eleven months stand as follows: Canada, 5,203 cwts. (153,684 cwts. 1920); Newfoundland 594,160 cwts (955,254 cwts in 1920). It is quite evident Finland is capturing some of the trade in packing and wrapping papers from Canada, in conjunction with Germany. Imports from the Dominion have fallen away to 776 tons as against 5,595 tons in 1920 in the eleven months and for November last 2,686 cwts as against 3,159 cwts in 1920. The total imports were as follows: Printing and newsprint, 2,439,409 cwts. (3,139,366 cwts. in 1920); Packing and Wrapping paper, 1,305,798 cwts (3,781,098 cwts in 1920); Coated papers, 49,292 cwts. (122,162 cwts. in 1920); millboard, cardboard, etc., 458,591 cwts. (1,574,837 cwts. in 1920); strawboard, 1,524,266 cwts. (3,264,478 cwts. in 1920); other sorts 236,167 cwts. (358,540 cwts. in 1920).

The eleven months exports are: Printing paper (newsprint and fine printings) 691,348 cwts. (970,073 cwts. 1920); writing paper, 122,601 cwts. (224,958 cwts); Packing and Wrappings, 144,474 cwts (315,600 cwts); Tissue paper 9,467 cwts. (11,597 in 1920); coated paper and paper hangings 39,370 cwts. (133,822 cwts. 1920; other sorts, 21,586 cwts. (31,858 cwts. in 1920); Roofing paper 28 cwts. (2,652 cwts. 1920); Millboard, straw and cardboard, 71,238 cwts. (82,284 cwts. 1920). Canada enjoys a good share of the millboard trade. Early in January the full year's trade figures will be available when comparisons will be deeply interesting.

Canadian Newsprint.

Mr. F. W. Field, Trade Commissioner in Toronto, reports to the Overseas Trade Department here that Canadian newsprint is not losing in foreign markets to European competition, although increased Canadian productive capacity should also be taken into consideration in comparing this year's exports with last. After dealing with the steady upward movement, he adds that the abandonment of the threatened railroad strike in U.S.A. did not result in cancellation of rush orders for newsprint which Canadian mills received.

Profits and Dividends.

Sun Paper Mill: £21,323 available for distribution; Dividend to be fixed. Carron Grove Paper Mill: Profit £19,173 net; Dividend 2s. 6d. on ordinary shares. Wall Paper Manlfacturers have recovered £48,800 in respect of factory in Germany.

CANADIAN PREFERENCE DELAYED IN JAMAICA THROUGH REJECTION OF TARIFF MEASURE.

Trade Commissioner, G. R. STEVENS.

Kingston, Jamaica, December 12, 1921.—For two days, Canada was in possession of a 5 per cent ad valorem preference in Jamaica, during consideration of the tariff. In accordance with Jamaican usage, the introduction of a message in the Legislative Council enforces it, and the Bill to Amend and Consolidate the Laws relating to Duties on Imports was introduced by the Collector General of Customs upon the morning of December 7. On the afternoon of December 9, the Bill, facing increasing hostility from the elective side of the Legislative Council, was withdrawn, and a resolution substituted to the effect that the Legislative Council affirmed the principle of Imperial Preference, reaffirmed its willingness to redeem the pledges given in the Canada-West Indies Agreement of June, 1920, but wished to enter into a more minute examination of the tariff before accepting any amendment or consolidation of existent legislation.

The key of the dispute lay in the loss of revenue engendered by the proposed preference, which in the rejected measure extended a 5 per cent ad valorem preference not only to Canada, but likewise to the United Kingdom, and also provided an opening for further reciprocal preferences within the Empire. The estimated loss in revenue by the extension of this preference was computed at £50,000 per annum. The Government therefore proposed to institute the Imperial and Canadian preference by an increase of duties amounting to 5 per cent throughout the general list, leaving British and Canadian rates at the old figure. The elective members of the Legislative Council took strong exception to this, claiming that such increases were against the interest of the consuming population, and by their unitedly hostile reception of the measure forced its rejection.

The inauguration of the Canadian preference may accordingly be some distance away. It is almost certain that the next session of the Legislative Council will attempt to revise the tariff, probably with the view to downward revision on foodstuffs and necessities, and an upward revision upon luxuries. If the elective side of the Legislative Council attempt any such revision, a long and severe contest may be expected. If, on the other hand, the Legislative Council should be satisfied with the defeat of the proposed increases, and are willing to drop the Imperial and Canadian rate to 10 per cent ad valorem, leaving the general rate at 15 per cent, the ratification may take place in February, when the Legislative Council will hold its next session.

WHICH ARE YOU?

There is just one way for us to come into life, but the careless man can find a thousand ways of passing out.

The world is so full of a number of things, I'm sure we should all be as happy as kings.

UNITED STATES NOTES

Judson G. Rosebush, general manager of the Northern Paper Mills, Green Bay, Wis., predicts an early end of the period of depression. In a talk to his sales force in conference last Thursday, Mr. Rosebush struck an optimistic note, basing his belief in an early improvement of general business conditions among other things upon liquidation, easier money, better exchange rates, and results accomplished by the disarmament conference. Production at the Northern Paper Mills went back to normal a little while ago. At the present time fifty additional men are at work, and plant extensions are being made to care for the banner year the company expects in 1922.

Irving Bachrach, who is well known to the trade in Chicago, has left the sales force of the Barton-Hobart Paper Company to head a company of his own, which is to be known as the General Paper Company. Mr. Bachrach's company has been capitalized at $10,000. It will handle a line of book and printing papers in a general brokerage way.

When the Royal Card & Paper Company moves into its new quarters at 132 to 36 West 14th Street, New York City, February 1st, it will be conducting its business in a building unquestionably the largest given over to paper warehouse use in New York. The new building consists of seven floors, store and basement with a total floor area throughout of 75,000 square feet. It is modern in every particular and will serve to bring together under one roof all of the company's departments and present warehouse. The firm is planning to add many new lines of paper and board. It intends making an announcement to the trade regarding these lines in the near future.

Paper Particulars, the interesting and informative house organ of the National Paper Trade Association of the United States, suspends publication with its December number. An announcement carried in the last issue states that the Association's Board of Directors cannot see their way clear to continue the magazine.

John F. Sarle & Company, paper dealers, have purchased buildings in Hudson and Thomas streets, New York City, to house their warehouses and offices. They will remove from their present quarters in John Street, where they have been located for forty-five years.

The International Paper Company has sold to a banking syndicate $12,500,000 of its first and refunding 5 per cent bonds. The purpose of the financing is understood to be consolidate and fund the floating indebtedness of the business. An early offering of the issue is expected. The total authorized amount of these bonds now outstanding, including this issue, is $19,396,000, and no further bonds can be issued under this mortgage. In effect the mortgage is closed and the property, bonded for less than $20,000,000, has a value conservatively estimated at $60,000,000, subject only to $275,000 underlying bonds.

Transparent wax paper envelopes, intended as a germ-proof covering, are being used for paper currency by merchants in Chicago. One store has started enclosing all bills it hands out in the waxed paper coverings. "We believe the idea is going to be popular," said the manager of this store. "Many customers, especially women, are averse to handling the dirty, often germ-laden, paper money which is in circulation. The waxed envelopes afford an unobstructed view of the bill and at the same time protect the customer from any germs which may be clinging to it."

Free cordwood will be given to the poor this winter by the State Forestry Department of Connecticut. In the Natchaug State Forest are a great many weed trees which are seriously interfering with the growth of valuable varieties like ash, oak, hickory and pine. The latter will make valuable products in a few years, while the weed trees will never make anything but fuel wood. The State Forestry Department recognizes two grades of fuel wood and has arranged to give away second-class wood for home purposes to those who will cut trees under the regulations of the department. Since there are at least 500 cords available for cutting this winter, and the average family consumes about ten cords, the State Forester estimates that at least fifty families can be supplied.

PULP STOCKS AT MILLS DECREASED.

Stocks of all grades of pulp in the American mills on November 30, amounted to 158,555 tons. Mill stocks of ground pulp and news grade sulphite decreased during the months, according to the Federal Trade Commision.

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917, 1918, 1919 and 1920, the figures show that:

Ground wood pulp stocks equal 24 days' average output.

News grade sulphite mill stocks equal 9 days' average output.

Bleached sulphite mill stocks equal 3 days' average output.

Easy bleaching sulphite mill stocks equal 3 days' average output.

Mitscherlich sulphite mill stocks equal 4 days' average output.

Sulphate mill stocks equal 15 days' average output.

Soda pulp mill stocks equal 5 days' average output.

Mill stocks of "other than wood pulp" equal 6 days average output.

Total mill stocks of all grades equal 14 days' average output.

BLOTTING PAPER NOW MADE IN CANADA.

After extensive and thorough experimentation blotting paper of the finest quality is now for the first time being introduced in Canada, the Howard Smith Paper Mills, Limited, of Beauharnois and Crabtree Mills, Quebec, and Cornwall, Ont., being the pioneers in this branch of the industry.

Hitherto all the blotting paper used in Canada has been imported, the imports being valued at about half a million dollars a year. The success achieved in producing blotting paper in Canada leads to the belief that not only will this country now be self-supporting but will soon be in contest in the world's markets for this as it already is for many other grades of paper.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, January 3.—At the commencement of the year men in all lines of trade survey the position of their industry, with special reference to their own branch or firm. Will the experiences of 1921 be repeated, or will there be a sustained revival, which will allow of fair profits on a substantial turnover? Undoubtedly most men are anticipating a more prosperous period than last year, with better prices in some directions. That hope is founded on reasonable expectations, certainly as far as the pulp and paper trades are concerned. Quotations have reacted to such an extent as to bring them down to a point which leaves little or no profit for some lines, and providing the anticipated general trade revival materializes the changes should be in an upward direction. In our export business, competition is still very keen, and this is likely to have an effect on the volume of shipments for some time to come.

Men of sound judgment in the pulp and paper industries are optimistic, but in weighing up the prospects they do not overlook the fact that previous estimates of people with life-long experience in the trade have been rudely upset by the unexpected. But taking this consideration into account, cautious men are of opinion that 1922 will prove a better year than the one which has just ended.

Business during the past week has been slow, owing partly to the holiday season, but it is encouraging to note that in some lines of paper the orders to hand were larger than in the corresponding week last year.

General retailers of paper in Toronto, while they have not balanced accounts for the holiday season, report a very satisfactory amount of business, especially in decorative tissues and stationery.

Everyone is now in the midst of stocktaking and until this is completed, there is not likely to be an extension of activity in either buying or selling, beyond movement of goods on contract or for current needs. No fall in price is anticipated, however, and paper merchants are not inclined to admit any recessions in prices unless convinced that a change in basic items of production or distribution warrant such action.

NEWSPRINT.—Canadian manufacturers of newsprint are naturally taking a great interest in the attempt by the American manufacturers to put a duty on foreign newsprint. The hearing before the Senate Finance Committee at Washington disclosed determined opposition by the publishers, who fear that a tariff will enable American manufacturers to boost prices to an unreasonable extent. As Canada is the chief exporter of newsprint into the U. S., a duty would undoubtedly prove damaging to our trade—a trade built up on a good supply of raw material, cheap water power, and efficient machinery. Canada has all the essentials for producing newsprint, and the demand of the American mills is for a duty sufficiently high to offset these natural advantages. The American publishers, however, are beginning to realize that, because of a shortage of pulpwood in the Eastern States, they must depend largely on importations of Canadian paper. Naturally, they do not want this to cost any more than a price established by competition with American mills.

PULPWOOD.—In the words of a large dealer, "business in pulpwood is dead, and I don't expect any revival for two or three months." The heavy stocks held by the mills will have to be drawn on more freely before there is any chance of their being in the market.

FINE PAPER.—Trade continues on a satisfactory basis. The outlook is stated to be good, with a promise of prices being maintained.

BOOK PAPER.——Orders are fairly good, and sufficient to keep the mills well employed. A certain proportion of the orders are of the rush character.

TISSUES.—Business is quiet, partly owing to jobbers taking stock, and an unwillingness to purchase pending the completion of this process.

ROOFING PAPERS.—Very little is doing, on account of the season.

RAGS AND WASTE PAPER.—The situation in both these commodities is unchanged. The supply of rags is none too abundant, and waste paper is scarce.

BOARDS.—There is little doing in this section, even at the lower prices recently announced. A larger volume of trade is looked for in the immediate future.

NEW YORK MARKETS.

New York, December 31—(Special Correspondence)—The final week of the year has witnessed little change in the paper market and no new feature. Buying has continued of hand to mouth character and the market as a whole has displayed a lack of important trade activity. Reports from mill centres in frequent cases tell of plants being closed down temporarily for repairs and inventory, and indications are that manufacturers in general have reduced their output until after the holiday season. This is not an uncommon custom at the end of the year and the shutting down of some mills has occasioned no comment of a pessimistic nature. On the contrary, sentiment in the trade is very optimistic. It is gratifying to note that manufacturers, pobbers and mill agents nearly all anticipate good business soon after New Years and freely predict that the market will open up with a rush during the near future.

The Federal Trade Commission's report on the paper industry of the United States for November, just issued, is highly encouraging, showing as it does that production activities last month were well above the average for the year 1921. A total of 538,876 net tons of all grades of paper and paper board was produced by U. S. mills in November, which although slightly under the mark of 542,408 net tons output in October proved to be the next best month of the year for the industry. When it is considered that November has only 30 days and that there were two holidays during that month, production of paper ran on a par with that in the preceding month.

Mill stocks of paper increased slightly during November, the report shows, but the increase was of small importance. Mills held a total of 248,927 net tons of paper of all kinds at the end of November, compared with 244,657 tons at the outset of that month.

Demand for newsprint has eased off somewhat during the last few days. This was to be expected in view of the heavy buying by publishers prior to Christmas, the lighter consumption during the week preceding New Years, and the scale of prices becoming effective next week. On Monday the contract basis on roll newsprint will be 3.50 cents per pound, or $70 a ton, at mills, and publishers have naturally held back in buying until the new price becomes effective. Everything points to a continued good consumption of print paper. Retailers the country over are making a drive to complete the liquidation of stocks of merchandise inaugurated some time ago, and will doubtless use much printer's ink and advertising space in the effort to attract buyers. Advertising in numerous directions is on the increase—in daily newspapers, magazines, trade mediums and other publications—and it goes without saying that this is the best development possible leading to a larger consumption of paper.

There is little life to the book paper market. Consumers are taking such commitments as they have coming to them on contract, but fresh demand has been slow recently and a majority of mills are looking for orders. Confidence is expressed that demand for book paper will soon expand, it being felt that publishers of periodicals will necessarily have to increase their buying the moment their requirements become larger because of their close buying for some time past. Machine finished book is quoted at between 6 and 6.50 cents a pound f.o.b. New York. The large mills which sell most of their output on contract are obtaining the higher figure, and only certain grades of book paper are to be had at 6 cents. Coated book is quoted at from 8 cents a pound upward.

Fine papers are quotably steady and demand for them has not let up to any important extent of late. Tissues are also in fair demand, and there is a consistently good movement of wrapping papers with prices holding strong. Box boards have not improved their market position to any apparent degree yet mills are maintaining quotations at the recent advance and are not pressing consumers to buy, presumably figuring that the usual buying movement along about January 15 will develop this winter as heretofore.

GROUND WOOD.—Federal Trade Commission figures show that the production of ground wood by United States mills in November jumped no less than 25,675 net tons above that of the preceding month to a total output of 108,186 net tons, very nearly approximating the average monthly output based on reports for the past four years of 118,025 tons. Despite this large increase in production last month, mill stocks of ground wood declined, amounting to 115,363 net tons at the end of November, compared with 119,406 tons at the beginning of that month. These figures indicate a heavy increase in consumption of mechanical pulp in November, and bear out many reports concerning the larger operations of newsprint mills.

The market rules quite steady although characterized by less trade activity during the last few days. Domestic grinders continue to quote around $32 a ton at pulp mills for prime spruce ground wood, freshly ground, for prompt shipment, and importers of ground wood from Europe tell of securing $34 and $35, and even higher prices, for pulp on the spot here. There is little or no selling pressure and quotations are firm in tone.

CHEMICAL PULP.—Current demand for chemical wood pulp is rather narrow; that is to say consumers are buying in scattered directions and generally limiting orders to tonnage directly needed. At the same time a comparatively good business is passing in most grades of sulphite for this season, and prices are marked by a steady undertone. There are few "weak" sellers in evidence, and buyers invariably find it necessary to meet the quotations named to obtain supplies.

Production of wood pulp in the United States reached a new high mark for the year in November, according to the Federal Trade Commission's report for last month. A total of 271,787 net tons of all grades was produced by domestic manufacturers in November, of which 163,601 tons were chemical pulp and the balance ground wood, showing an increase of 37,577 net tons over the October output. Last month's production was only slightly below an average monthly output for the last four years of 281,400 tons.

RAGS.—Papermaking rags continue in a quiet market position. Few consumers are coming into view as buyers at present excepting occasionally when in immediate need of supplies, yet there has been no further downtrend of note in prices this week. Dealers are expecting a much broader demand to arise early in the new year, and are mostly pursuing a waiting policy just now, having found through recent experience that efforts to induce mills to buy avail them nothing. That the basic tone of the market is firm can be detected from the fact that few, if any dealers will book orders involving any sizable tonnage for forward delivery. Spot lots of limited volume can be picked up by buyers here and there at attractively low prices, but it is another matter to persuade a dealer to commit himself for the future, thus reflecting the confidence felt that prices are due for a rise before long.

Sales of satinets to roofing felt mills still comprise the bulk of current business, with No. 2 satinets fetching around 80 cents a hundred pounds f.o.b. New York. No. 1 white shirt cuttings in small lots have sold to paper mills at 10 cents a pound New York, old No. 1 miscellaneous whites at 4.75 cents a pound, and No. 2 miscellaneous whites at around 2.15 cents.

PAPER STOCK.—Demand from consuming quarters for old paper has increased but slightly, if at all for most grades, and yet the tone of prices is unmistakably stronger. This is due, it is said, to the fact that collections have been reduced to such a level that available supplies are short, thus causing dealers to be more cautious in accepting orders from mills unless at better prices. Hard white shavings of No. 1 quality are quoted at from 3.75 cents a pound New York up to 4 cents, and No. 1 soft white shavings at about 3 cents. Old books and magazines hold unchanged at an average of 1.25 cents per pound, old No. 1 kraft paper at 1.60 cents, white blank news cuttings at 1.70 cents, folded newspapers at 47 ½ to 50 cents a hundred pounds, and No. 1 mixed paper at 35 cents.

OLD ROPE AND BAGGING.—Prices on old rope rule steady and consuming mils are reported absorbing most of the supply of old No. 1 manila rope offered at between 4.75 and 5 cents per pound at dealers' shipping points. Old bagging is dull, with practically no market activity noted aside from an occasional sale of No. 1scrap bagging at 90 cents to $1 a hundred pounds.

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And lay away your horn,
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INQUIRIES SOLICITED:

VAPOR ACCUMULATOR.

(Another article about the Vapor Accumulator appeared in Pulp and Paper Magazine of Canada, Dec. 8, 1921, page 1250. See also Abstract K-12; N-4, under Technical Section this issue.)

In the majority of industrial plants where steam is used, the steam consumption varies. This means that the fire under the boilers will have to be changed according to the variations in the steam consumption, which again means poor steam economy with the risk of either shortage of steam or a surplus, with the safety valves blowing.

Instead of giving their attention to the matter of obtaining the best possible combustion with a high CO_2 percentage, the firemen have to watch the pressure in the boilers, always to be ready to increase or decrease the steam supply.

If the fireman has fixed the load and the draft of the boilers for a good combustion, the next time he changes the rate, the CO_2 will drop or go too high, and thus it is impossible always to keep the combustion at the point where it should be.

It is also a common occurrence that one or two boilers are kept under fire in order to take care of the peaks in the load which can not be provided for from the boilers normally required.

It is obvious that the economy of these "spare" boilers is exceedingly poor.

The above conditions which undoubtedly have been noticed by every boiler house superintendent, have been considered impossible to get away from, and, on account of the absence of any way to improve them, they have been considered unavoidable.

Lately, however, an invention called the "Vapor Accumulator" has come into use extensively in Europe and the results obtained with same have been very good.

The idea of the "Vapor Accumulator" is to store the excess steam produced at times of flow steam consumption until periods of high steam demand when it is again drawn off.

The accumulator, in other words, acts as a reservoir between the steam producer and the steam consumer and the firemen have only to watch that the accumulator does not get empty or too full.

In this way, the boilers need only produce the **average** quantity required for the plant and the load of the boilers can be kept even and independent of the temporary steam requirements.

It is evident that only that number of boilers necessary for the production of the **average** steam quantity required need to be under fire, which means that the "spare" boilers can be entirely eliminated and often one or more of the others.

The accumulator is equipped with complete automatic regulation worked by the pressure in the various steam lines. This gives a practically constant pressure to all steam consumers.

Besides the direct saving of fuel gained by the use of the accumulator, the operation of the plant itself is simplified to a considerable extent.

The power house takes the place of an auxiliary equipment in the plant, which it ought to have, after the "Vapor Accumulator" has been installed, and not, as has heretofore very often been the case, the position of the most vital part of the plant, according to the condition of which every other department had to be operated.

In case of a sudden stop in the operation of a boiler, or cleaning, etc., the accumulator will step in, to a certain extent, so that no break in the steam supply will be noticed in the other departments of the plant.

In pulp and paper mills where it is of utmost importance to have an even and high quality of the product, it is very valuable to be able to keep the desired pressure constant both in the digester houses, paper machines, drying machines etc., at all times, even when, of one reason or other, there should be disturbances in the boiler house.

The Mellon Institute of Industrial Research announces the appointment of Mr. Maurice C. Walsh, C.H.E., as the incumbent of the Container Club's industrial fellowship in the Institute. Mr. Walsh succeeds Mr. J. D. Malcolmson, who, after January 1, 1922, will be connected with the Robert Gair Company, 350 Madison Avenue, New York City.

British Trade Ship.

The British trade ship, which will make a tour of the world, will excel the American one in every way. At present the idea is that the British ship will be a floating showroom of goods and models of every description and paper will be included in the exhibits. By means of this tour it is hoped to build up once again the British export trade and to realise this object nothing is being left undone.

Fashionable people are apt to starve their happiness, in order to feed their vanity.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. **GARDENVALE, P.Q., January 12, 1922.** **No. 2**

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J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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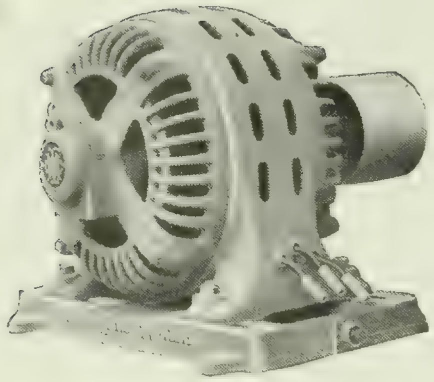

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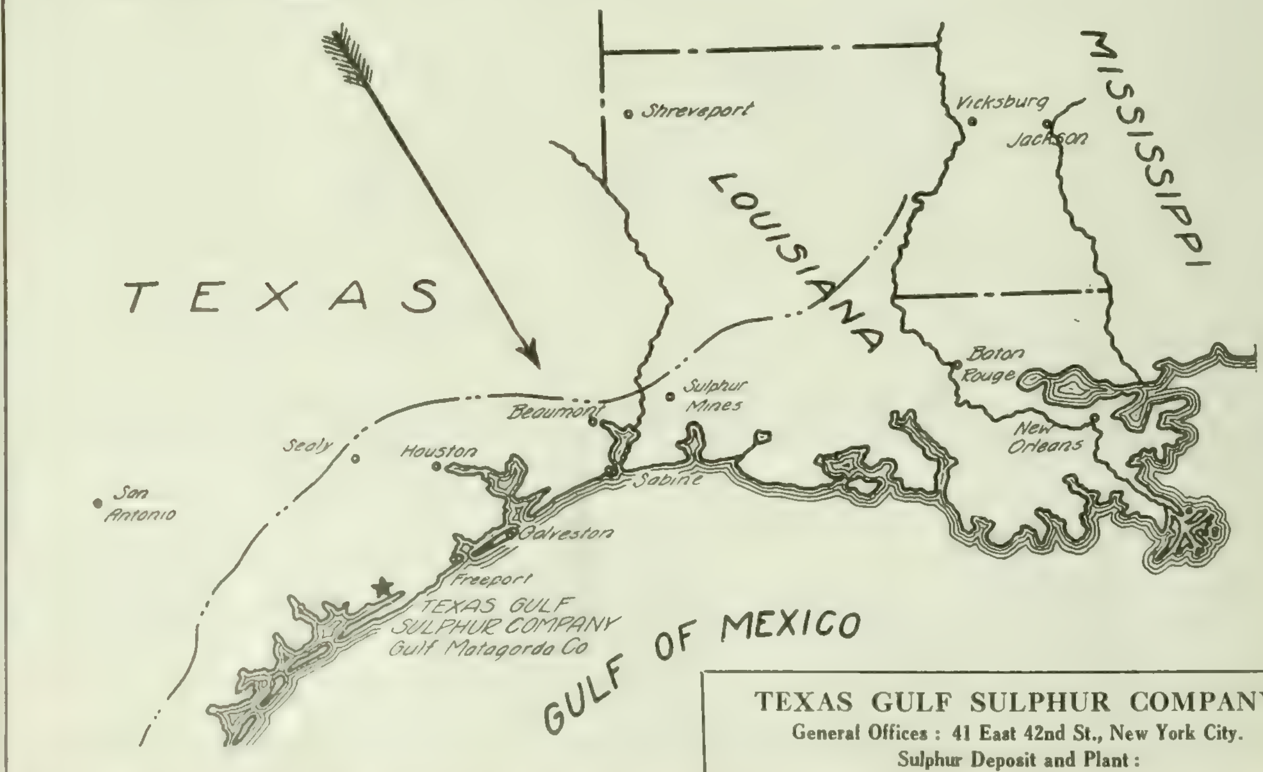

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:-: EDITORIAL :-:

WE SHOULD WORRY!

As we go to press, the strike which took place on the 7th instant, at the plant of the Garden City Press, Ste. Anne de Bellevue, where this journal is published, still continues. The circumstances leading up to the strike are made sufficiently plain in the correspondence between the publishers and the Montreal Typographical Union No. 176, which we publish elsewhere in this issue.

At the moment, this journal is, naturally, being produced under substantial handicaps owing to this occurrence. Accordingly, should it not reach its usual standard for a few weeks, we must ask the indulgence of our readers and advertisers and friends generally. There is the best reason for believing that, in a very short while, the difficulties, at present attendant on its publication, will have been completely overcome.

PROSPECTS FOR THE ANNUAL MEETING.

The Canadian Pulp and Paper Association has an enviable record of successful meetings. We frequently hear our American friends say how much they enjoy getting to Montreal and taking part in the interesting discussions and the good fellowship which always characterize the annual convention of the Canadian Pulp and Paper Association. These repeated successes are due principally to the careful preliminary work of the Executive, and particularly of the Secretary, in planning and arranging for an instructive and interesting program and to the whole hearted way in which those attending the convention take part in its proceedings.

The program for paper week, which was printed in full in our last issue, provides, as will be seen, for the separate meetings of the various sections connected with the association and care has been taken that so far as possible no two meetings in which the same people are likely to be interested will occur at the same time. This has not been altogether possible since it was necessary to provide for such extensive programs as are represented in the work being done by the Woodlands Section and by the Technical Section. Opportunity no doubt will be found, even by those who have other business during the day, for attendance now and then at the sessions of these Sections as the activities of these divisions of the association are really fundamental to the success of the industry.

It is a very encouraging sign that so much interest and such hearty support are now being given to the Woodlands Section and so much attention is being paid by the management of our mills to the recommendation of the foresters who have made careful study of present conditions and estimates of future requirements both as to demand for pulpwood and the provisions for this supply. As Mr. Edward Beck pointed out in his address to the Canadian Forestry Asociation last week and in the bulletin distributed by the Pulp and Paper Association, Scandinavian countries as much as two generations ago grasped the fundamental truth of the need for the most careful conservation of timber lands and the most intelligent exploitation of the forests in order to ensure continuity of operation of industries dependent on the use of wood. The need for scientific operation of the forests is beginning to be appreciated by the management of our mills, but none too soon. Better methods of handling our woodlands have been agitated for since the beginning of the century by a few of those who knew the actual conditions and foresaw the effect of the methods then and now in general use. These prophets have for the most part been without a hearing until very recently and even now there is in some quarters a tendency to minimize or intentionally shut eyes on the actual state of affairs. However, those who have only the good of the forest, and the provision for continual supplies of raw material for our industries, at heart, are not discouraged by an occasional cold shoulder but are steadfastly laboring to bring about a better appreciation by the public of the serious need for better methods of administering our forest resources. The associations with which they are connected are laboring steadfastly to develop and apply methods of utilization that will not only make use of a much larger proportion of forest growth but will leave our timberlands in a constantly productive condition. It is an enormous task and requires great courage and patience on the part of the forester, and sympathy and encouragement from the public and the Pulp and Paper and Lumber Industries. These people must realize that exhaustion of the timber will automatically put the mills out of business and thousands out of employment while improper methods of administration of the forest will eventually make the wood cost so much that wood products cannot be made in Canada in competition with those from other countries where the forests are properly handled.

The Technical Section, for which is provided one of the most interesting programs in the history of this very live organization, has to do with the technical guidance of manufacturing operations and the solution of problems which come up in the mill. The work done by members of this Section is of the greatest importance to the industry both in conserving waste and in the reduction of operating costs by the proper selection and use of materials and by helping to maintain quality and to meet specifications. A number of interesting and important mill problems are to be discussed at the meeting this year and the program has been arranged particularly with a view to having a thorough disucussion by many members, of a few fundamental factors rather than to present the views of a few individuals on a great variety of topics.

The hearty response that has been sent in by an unusually large number of members who express their intention to attend is not only very promising as regards the success of the meeting but is very encouraging and greatly appreciated by the new secretary who has given so much thought to the development of plans for the meeting. It is earnestly hoped that everyone who attends will do so with the intention of taking some part in the meeting, which begins Jan. 25th at 9.30 a.m. and continues through the 26th. Each one will have received a copy of the program and those who have not will find a condensed program in this issue. It is probable that instead of the paper on "Wire Mats for Pressing Pulp", a paper on "Saving Money by Testing Moisture" may be substituted. In any case, there are papers which every member should be able and ready to express some opinion and furnish some information about, and if the members will do this, a new era will be inaugurated in the history of our section.

Strike at Garden City Press

Correspondence between the Publishers of the Pulp & Paper Magazine of Canada and the Montreal Typographical Union No. 176.

Editorially we make mention of the fact that there is a strike at the plant where this paper is published. The principles at stake are made clear in the following correspondence which sufficiently explains itself.—Ed.

The Union Ultimatum.

Montreal, December 17, 1921.

To the Board of Directors
Garden City Press:

Gentlemen:—

Notwithstanding the fact that the management of the Garden City Press has not at any time signed an agreement with this Union, it has nevertheless always conceded and operated under the terms of the contract made between the employing printers' associations and the Union.

One of the clauses embodied in all of these contracts is as follows: All employees of the composing room... shall be members of Typographical Union No. 176...

Previous to the expiry of the most recent of these contracts on June 30th last an effort was made to inaugurate the 44-hour week, and the Garden City Press was one of a number of offices where the shorter work week was then established. Because of the failure to procure this condition in other offices a proportion of our members was barred from working in these offices. Anticipating such a contingency the advisability of creating a defence fund was foreseen and an assessment of ten per cent. was levied on all earnings.

Advantage of the situation thus created was at once seized by certain parties to extend the activities of the National Catholic Syndicate to the printing industry, and four of our members of the Garden City Press were influenced into joining this Syndicate, and the reason or excuse given for their action was that they found it impossible to continue paying the said ten per cent. assessment.

Repeated attempts were made by the officers of this Union to dissuade these men from severing their connection with the I. T. U. and the President of the Garden City Press himself pointed out to them the inadvisability of their contemplated severance. Argument and persuation, however, were of no avail and apparently these men could not be made to see that they were refusing to support their fellow-members in an effort to procure what they themselves were enjoying. Investigation proved that in one case at least it was a repetition of history as the same trouble was encountered in the struggle for the 48-hour week. At that time, of course, there was no Syndicate into which to drift.

The argument that the action of these men was likely to disrupt the relationship existing between the management and the Union was likewise unheeded. The men evidently felt secure in their position and were callous to the results of their action on the other 75 per cent. of the employees in the composing room and on the management.

With set purpose of endeavoring to re-establish former conditions, and of maintaining, if possible, the friendly relationship, no steps were taken to withdraw the members of the Union from this office. Until Tuesday of this week, December 13th, there were excellent hopes that the situation could be adjusted, but on that day two other men were added to the composing-room staff who were not members of this Union, and it was then decided that as matters seemed to be getting worse instead of better, our members should be withdrawn.

As the result of an interview with the President of the Garden City Press, it was agreed that yet another effort should be made to adjust matters, and a request was made for a statement from the Union setting forth the minimum conditions under which an agreement might be reached, and that such statement would be placed before a specially summoned meeting of the Board of Directors. This statement is herewith set forth:

> That the composing-room staff shall be restored to its former standing and only members of the Typographical Union be employed therein; this to imply that the four men first mentioned above may re-establish their membership and the two men recently engaged be discharged or, should they prove to be competent printers, make application for membership.

It may be permissible to state further that we have, for the past three weeks, borne the railway expenses of our members who are travelling from the city daily, and this may be taken as an indication of our willingness to do our utmost to save the situation.

It is the sincere desire of the members of the Union that the previous cordial relationship between the management of the Garden City Press and the Union may remain inviolate.

Truly yours,
THOS. BLACK.

Montreal, December 31, 1921.

J. J. Harpell,
President Garden City Press,
Ste. Anne de Bellevue, P.Q.

Dear Mr. Harpell:—

Owing to developments in the situation at Garden City Press, and having regard to the fact that the action out of which the trouble originated, is not likely to be favorably adjusted, it is the opinion of the Strike Committee that our members can not longer be permitted to work under existing conditions, I have therefore to notify you that the members of this Union now working at Garden City Press will be withdrawn on the evening of Thursday, January 5th, 1922.

The situation can only be saved on the understanding that conditions immediately revert to those existing at June 30th, 1921—namely, all members employed shall be members of Montreal Typographical Union No. 176, and conditions of contract as verbally agreed to shall be observed.

Very truly yours,
2 THOS. BLACK.

The Publishers' Reply.

Gardenvale, Jan. 4, 1922.

Mr. Thos. Black,
President, Montreal Typographical Union 176.
Room 35, Herald Bldg.,
Montreal, Quebec.

Dear Mr. Black:—

The ultimatum submitted with your favor of the 31st, just received, comes as a great relief. It puts an end to a situation that is becoming intolerable.

So that there may be a chronicle of the facts leading up to this condition, I will rehearse them here and if I make any statement to which you take exception please let me have your version.

Up to the 30th of June and for a month thereafter the relations between our company and your Union were most friendly. We were the first and the only large printing plant in the district of Montreal to grant a forty-four hour week; in fact, we gave it without being asked. We have always paid better than your scale of wages and working conditions in our shop are of the best.

All went well while our men continued their membership in your Union and submitted to the tax of ten per cent of their wages to support those of your members who were on strike from other shops that had refused the forty-four hour week. Your Union had given its members to understand that five weeks would be the limit of this tax and all our men here continued to pay to the end of and even beyond this period, but when your Union failed to keep its promise your working members began to grow restless and many of them, both here and elsewhere, dropped their membership. Some of the French members of your Union took out membership in the National Catholic Syndicate. At that time we gave your officials access during working hours to the men in our plant who had dropped their membership in your Union. In fact, we did what we could to help you persuade them to renew their membership. This we did against our better judgment: first, because we realized, as did your seceding members, that when a strike is allowed to drag on beyond a reasonable time it becomes increasingly difficult to secure a settlement in the interest of the strikers. Those who take the place of strikers become more and more efficient while men on strike suffer a lapse of skill and acquire habits of indolence and indifference that make them less desirable when they are ready to return to work. This is particularly true of men in receipt of such handsome weekly allowances as your Union has been paying its strikers.

Our second reason for feeling that your Union did not deserve the assistance we gave it in trying to persuade the men in this shop to continue their membership in your Union was supplied by your Vice-President, Mr. Hayes of Indiana, U.S.A., when he swore, at our meeting with him in Montreal at the Windsor Hotel, last autumn, a determination to "teach the Catholic Church a lesson" for what he interpreetd as their interference in labor matters. Whatever may have been Mr. Hayes' grievance against the Catholic Church or any other church, we did not consider that we had any right to assist him to teach them a lesson.

When you failed to persuade your men to renew their membership by peaceful means, you appealed to us to use coercion by threatening them with dismissal. This we absolutely refused to do. From this time on there was a very noticeable persistent demand on the part of our superintendent here for more men, although there was no increase in our work. With the advent of every increase in our force there really seemed to be a decrease in the output and our costs began to mount until within a short time they had increased by 52 per cent. when the writer found he had to interfere. When the costs continued to go up we found it necessary to dismiss our superintendent. The next man we dismissed was a man on the night staff who was giving a production of less than 500 ems an hour, whereas the minimum, as you know, is from eight to nine times this, according to your own statement. At that time we felt we could not afford to reduce our force so the writer appealed to you for another man to work at night. Instead of one you sent two, a Mr.... and a Mr.... who, you claimed, were very rapid typesetters. The first night their work was fairly satisfactory but the second night they came out well supplied with liquor which they consumed between them and in company with our night pressman. The next morning we dismissed these two men and our night pressman, a man who had been with us for several years and who before that occasion had done his work and conducted himself satisfactorily. The next man we dismissed was a Mr...., an old man of 54 years, who, I understand, has been in the habit of tramping about from place to place and drinking very heavily, with the result that he is never in a fit condition to do a fair day's work. His largest production here in any one day was less than 1,500 ems an hour and some days he went down to below half that per hour. The next man we dismissed was a monotype operator whom we were very glad to be rid of. He did not earn his wages and in many respects was highly undesirable. The last man to go was dismissed because he either did not know his work or he loafed on the job. With all these dismissals we have a larger output today than we were able to secure with the larger staff.

What was very noticeable during the writer's interview with all the above mentioned dismissals was the very great readiness on the part of the men to go. There seemed to be a decided preference on their part to be on strike rather than to be at work. On more than one occasion men whom you have sent out here to look for work have refused a salary of $36.00 for a forty-four hour week and declared their preference to walk the streets and receive strike pay of $25.00 a week.

We are rather glad that the break is coming for another reason, namely that it will leave us free to handle our apprentices in the future in the way we think they should be looked after. The unreasonable regulations of your Union regarding apprentices have shut out the best class of young men and women from the business of type-setting and resulted in a rapidly increasing preponderance of old men in your organization. There is nothing more unsatisfactory than your regulation which limits a shop of the size of ours here to three apprentices in five years. And it was very annoying a few weeks ago when we took on the fourth boy in five years to have the head of your Chapel come to my office and request that he should not be allowed to go to work. In order to avoid trouble I acquiesced and the boy was sent away. We have many bright youths in this community who are anxious to learn the business of typesetting but they will be old men and women before the opportunity comes to them if we continue to recognize the apprenticeship regulation of your Union. Since we came out here we have been axious to start a school for apprentices and it is good to look forward to a beginning of this work.

I trust you have not been led to believe by the arguments presented above that we are in a mood to throw up our hands and quit. This we are not in the habit of doing until the last gun is fired in an effort to do our whole duty and we feel that we still have a duty to the members of your Union who have been with us here for years and who are satisfied with conditions here and with the fellowship of their co-workers who are now not members of your Union. They have to-day each and everyone signified their willingness to continue in our employ if a strike is not called.

As a final effort at an amicable settlement we have approached the Department of Labour at Ottawa with the request that they communicate with you in the hope of gaining your consent to the appointment of a Board of Arbitration and Conciliation for the arbitrament of the question on which you threatened to call a strike, in your letter of the 31st. In order that they may have all the facts of the case we are by concurrent mail writing them as per enclosed copy herewith and sending them a copy of this letter, together with a copy of your letters of the 17th and 31st of December.

Yours very truly,

J. J. HARPELL.

Union Comments on Publishers' Letter.

Montreal, January 10th, 1922.

Dear Mr. Harpell:—

In your letter to me of date Jan. 4, in which you ask to chronicle the facts leading up to the present situation existing in your plant, you ask that if I take exception to any statement to inform you of same. I now avail myself of that privilege and would seek to correct some misstatements in the hope that the chronicle may finally appear strictly according to fact.

Referring to Paragraph 4 of your letter I must emphatically deny that this Union gave its members to understand that the ten per cent. assessment would not extend beyond five weeks. You evidently have been misinformed on this point.

In Paragraph 5 allusion is made to a conversation with Mr. J. W. Hays. I was not present at the time of the conversation but Mr. Whitaker and Mr. Gauthier inform me that what Mr. Hays did say was that "If the Catholic Church or any other church or any other organization sought to interfere in Labor matters the I. T. U. would teach them a lesson."

Paragraph 6 contains numerous statements that I am unable to refute or confirm. It would be difficult to adduce necessary evidence. Speaking personally I cannot recollect suggesting coercion. However, this is a fine point and does not materially effect the matter. In reference to the superintendent of the plant it is my opinion that Mr. Philip and myself were informed at the time that the superintendent of the plant had resigned and had asked that his resignation might take immediate effect. It was also stated that the superintendent had been requested to take two or three weeks vacation instead of resigning his situation. This opinion was confirmed by the superintendent on Saturday, Jan. 7.

Regarding these two operators referred to, I must say that two men were sent at the request of the management of the Garden City Press.

So far as their first night's work is concerned, the statement that their work was "fairly satisfactory" is not a generous statement, the work of one of the men that night was regarded as an extraordinary night's work. The second night's work was unsatisfactory and I sincerely regret the attested cause.

It is impossible for me to attach the blame for this supply of liquor.

So far as Mr....is concerned, he states that the condition of the machine was the cause for the small output. How far this is correct I cannot say. I believe, however, that an investigation will show that this particular machine is not in a satisfactory condition and that continual trouble is encountered with the electrical appliance.

On taking up the matter covered in Paragraph 9, our members inform me that none were willing to continue at the Garden City Press under existing conditions. Were former conditions to obtain they admit that they would certainly have been pleased to remain.

In reference to the suggested appointment of a Board of Arbitration, I have to state that: As it was a principle that was involved, and not hours or wages, the matter could not be submitted to a board. This was explained personally to the Minister of Labor.

In conclusion, let me say that the Union did not hastily decide its final action. Every effort has been made to have matters amicably adjusted and the final decision was come to only after mature consideration and much patience.

Might I ask that in the event of your chronicle being modified according to the explanation herein set forth, you will forward such to the Minister of Labor so that the previous chronicle may be withdrawn.

Yours truly,

THOS. BLACK.

Publishers' Rejoinder.

Gardenvale, Jan. 12, 1922.

Dear Mr. Black:—

Really I cannot see much, if any, difference between the account given in my letter of January 4th and that set forth in yours of the 10th instant, just received.

The statement about the five weeks was made in your presence by Mr.... and you did not correct it. But this is not a material point. The fact remains that the only reason given by your seceding members was that they refused to continue to pay the strike assessment your Union was levying.

As regards Mr. Hayes' statement, your version of it suits the reference made in my letter of the 4th.

The word "coercion" was my own, and used to interpret your demand that I should force the seceding members back into your Union by threatening to dismiss them. This was the cause of the whole trouble, for when I refused to dismiss or even to threaten them with dismissal, you called a strike.

The facts concerning the superintendent leaving were these. On Saturday, December 17th, I told him that matters were getting into such a condition that I would have to take charge of the work myself until things were adjusted and that during this period I did not want him around. If he would go away on a two or three weeks holiday the company would pay his expenses, but if he refused to do that he would have to hand in the keys on the following Monday morning. He handed in the keys on the following Monday morning.

I consented to two men because, as you will remember, you thought one might be lonely. As it turned out they proved to be jovial companions, particularly when they had a supply of liquor. I used the words "fairly satisfactory" because the production of these two men at no time was over 4,000 ems per hour per man, which is the minimum an average man might be expected to set.

The machine Mr.... used has been continuously operated since he left with satisfactory results.

I can only repeat that each and every one of those who went out from our shop when you called the strike told me they were well satisfied with conditions here and that they would not quit unless they were called out by the Union. Of course, the fact that they did continue to work right up to the time when the Union called them out is evidence in itself that that was the only cause for their quitting. They were free to go at any time they wished.

I consider your version does not contradict but corroborates the statements made in mine of the 4th.

Yours truly,
J. J. HARPELL.

Pumps and their Characteristics

By E. F. Doty.

(Continued from last issue)

DOUBLE CYLINDER OR DUPLEX PUMPS

These are usually known as Duplex Steam pumps and are so named for the reason that the pumping unit consists of two steam pistons and cylinders located side by side and the steam pistons directly connected by means of piston rods with two water pistons or plungers working in two water cylinders.

In general the duplex pump may be said to consist of two single cylinder pumping units connected together and working in parallel except that the control of the steam valve gear is essentially different from that of the single cylinder pump.

The Duplex steam pump is undoubtedly the best known type of steam pump which has ever been designed. Fig. 9 shows a diagrammatic section through the full length of a small size duplex pump with the packed piston type of water cylinder.

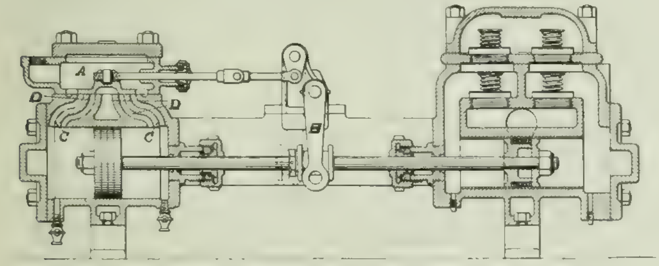


Fig. 9.

The most usual form of steam control mechanism consists of two slide valves of the ordinary D valve design (though piston valves are used on high pressure and superheated steam) and by reference to the sectional drawing it will be noted that only one valve is shown the other valve is placed along side of the valve in view and moves over steam and exhaust pores which serve the steam cylinder in the opposite side. Each steam cylinder has its own set of steam and exhaust ports which are usually in line with each other in both cylinders.

The arrangement of the steam valve gear of the duplex pump is such that the movement of the piston of one side of the pump controls and moves the steam valve on the opposite side of the pump and vice versa. The steam valve equipment therefore consists of two valves A which are moved across the steam and exhaust ports. The valves are always set so that when the pump is at rest the steam ports are slightly open to one of the cylinders at one end. Upon the admission of live steam the piston moves the lever B which controls the valve motion of the opposite cylinder and moves the steam valve to open the steam port which starts the piston in the second cylinder in motion in the opposite direction to the piston of the first cylinder which is already in motion.

It will therefore be seen that both steam pistons of the duplex pump do not start together—not do they begin to move in opposite directions simultaneously but one piston commences to move and then the opposite piston starts in motion—this alternate movement of the duplex pump is continued throughout its operation and is inseparable from this type of steam valve control.

This alternate motion of the duplex pump ensures a steadier flow of water than in the case of the single cylinder pump for the reason that in the case of the latter the moving parts come to rest momentarily at the end of each stroke during which period there is a perceptible decrease in the volume of water discharge, while in the duplex pump during the rest period of one piston the piston at the opposite side of the pump is moving at its highest rate of speed and thus a steadier discharge volume is maintained—the pressure at the pump discharge is on this account more nearly constant and the strain and vibration on the piping system due to varying pressure is greatly reduced.

With the exception of the steam valve gear the same types of construction are used in both the simplex and duplex pumps, that is, the details of the steam and water cylinders, pistons, plungers, rods, water valves and other details are of similar design and in the case of manufacturers offering both types many of these parts are so standardized as to be interchangeable in pumps of either type and of perhaps different sizes and capacities.

In the case of Fig. 9 above referred to we have a characteristic design of duplex pump of the packed water piston type. This is the most common type of direct acting pump which most manufacturers build in two standard groups.

1st.—The low pressure or so called tank pumps are usually offered for maximum water pressures of 75 or 100 lbs per square inch working pressure and have water cylinders designed for strength with these maximum pressures in view and are equipped with steam cylinders which are capable of driving the water pistons against their maximum pressures when supplied with steam at 100 lbs per square inch pressure, as the standard specifications.

These pumps, as their name implies, are most suitable for general low pressure service up to their limits of working pressures and where required for handling water or other liquids which are comparatively free from gritty or abrasive matter which would tend to cut and wear the liquid cylinder liners and cause leakage past the pistons. These pumps are not suitable for ordinary boiler feeding for the reason that the strength of the water cylinders and the proportion of areas between steam and water pistons are not suitable for this service.

2nd.—The general service type of packed piston pumps are designed usually for maximum working water pressures of 150 or 200 lbs per square inch and the proportions of steam and water cylinders are such that they are suitable for operating against the maximum water pressures for which they are designed when supplied with steam pressure at 100 lbs. per square inch, these pumps on account of their strength and cylinder proportions are suited for boiler feeding, water works and general water supplies where moderate water pressures prevail.

The next type of water cylinder construction which we will consider is known as the center packed plunger design and a conventional pattern which is generally accepted as standard is shown by Fig. 10. This is the same type of water plunger as shown by Fig. (4) and by reference to the sectional drawing it will be seen that the water cylinder is divided into two sections with the plunger developing pressure at one end and in one section and at the same time the liquid is flowing through the suction valves at the opposite end and filling the other section of the cylinder preparatory to a return pressure stroke of the plunger. The stuffing boxes surrounding the plungers are located between the cylinder sections and on account of this arrangement of the plungers and packings these pumps are known as the Center Packed Plunger Type.

The construction of these pumps is better adapted than the piston type of pump for operating against higher water pressures and the principal field for pumps of this type is where water pressures from 150 to 300 lbs per square inch are encountered and the combinations of steam and water cylinders available usually cover a range which will produce 200 lbs. water pressure with 100 lbs. steam pressure up to 300 lbs water pressure with 150 lbs steam pressure.

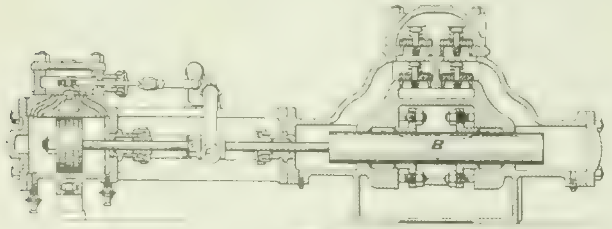


Fig. 10.

These pumps are usually preferred where gritty water is to be handled as any leakage through the packings can be seen without examining the interior of the pump and the .packings can be easily adjusted from the outside and scoring of the plungers due to grit working into the packings can be observed and rectified before it becomes serious.

For still higher water pressures the standard type of reciprocating pump is the end packed plunger type. A standard design of these pumps is shown by Fig. 11 and the diagram Fig. (3) shows the principle of cylinder and plunger design.

In this type the water cylinder is divided into two compartments by a wall or bulkhead A in the center of the cylinder. The plunger packings B are located at the ends of these cylinder compartments and each cylinder is equipped with two plungers which are connected together by siderods attached to crossheads located outside of the cylinder.

It will be seen that these two plungers operate on the same cycle as would two single acting plungers connected together, which in fact they are, but the arrangement of the plungers with the connecting side rods constitutes a double acting cycle, or in other words each stroke of the plunger performs a suction and a discharge function.

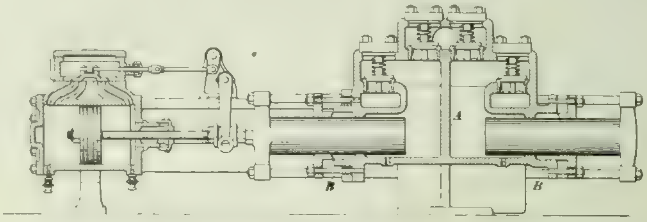


Fig. 11.

It is clearly apparent from the above description, whence the end packed plunger pump derives its name; the construction is most adaptable where high water pressures are to be dealt with such as extra heavy boiler pressures, hydraulic presses, and heavy pressure hydraulically operated machines in general.

These pumps are seldom used or recommended for water pressures lower than 250 lbs per square inch, not because they are not adapted to lower pressures, but that pumps of the center packed plunger or packed piston types are just as suitable for such conditions and are also less expensive.

The end packed plunger type pump is used for water pressures up to the maximum for which pumping machinery may be required.

Calculating Capacities of Pumps.

In order to familiarize the reader with standard capacities and cylinder proportions of steam pumps and especially to enable readers to study the relative values of steam and liquid pressures, we are printing some tables of standard sizes of steam pumps.

In addition to the data usually given in such tables we have provided some extra features which will show clearly how a steam pump should be selected for any pre-determined set of working conditions and which we shall explain as follows:—

Theoretically the work done by the water piston is equal to the area of the steam piston multiplied by the steam pressure exerted on that area and is expressed as A x P.

A=Area of steam piston in square inches=.7854 times the square of the diameter.

P=Steam pressure in pounds per square inch.

Therefore according to theory the work done by the water piston would also be A x P.

But as this condition assumes 100% efficiency for the entire pump and whereas there are mechanical, thermal, and hydraulic losses which take place in the pump these loses must be overcome by the steam piston before any effective work can be done by the water piston. These losses are usually provided for in estimating the "efficiency" or percentage of theoretical perfection which can be expected of any given pump and the losses are counteracted by providing a steam piston of larger area than the water piston or by furnishing it with higher steam pressure than the water pressure pumped against. Either method is equally effective when arranged for in proper proportion.

The problem therefore becomes:—

$A' \times P'$ = Load or work on water piston,

where A' = Area of water piston in square inches, and P' = Water pressure worked against in square inches.

And in order to do the work represented by the Load or Work on the water piston, the steam piston must exert effort represented by

$A' \times P'$

———————

Efficiency of the pump

= Load on or work performed by steam piston.

We will consider first some standard sizes of single cylinder or simplex steam pumps designed to operate against water pressures of 50 pounds per square inch and illustrate how the steam and water cylinders are proportioned so as to secure the proper power in the steam end to work against the required liquid or water pressure and at the same time allow proper excess power to overcome the losses above referred to:—

Size of Pump as usually expressed.	Diameter Steam Piston (inches)	Area Steam Piston (square inches)	Load on Steam Piston (pounds) — Area x 150 lbs. Steam Pressure	Diameter Water Piston (inches)	Area Water Piston (square inches)	Load on Water Piston (pounds) — Area x 50 lbs. Water Pressure	Efficiency of Pump (water piston load divided by steam piston load)	Capacity of Pump Gallons per Stroke	Normal Number Strokes per minute	Capacity of Pump Gallons per minute	Travel or Speed of Piston (feet per minute)
7″ × 10″ × 12″ . . .	7	38.3	5760	10	50.3	2510	64.7 %	1.75	82	143	55
5¾″ × 8″ × 8″ . . .	5¾	25.8	3880	8	78.5	3930	68.3 %	4.03	66	265	66
8″ × 12″ × 12″ . . .	8	50.3	7550	12	113.	5650	75. %	5.88	66	387	66
9¼″ × 14″ × 12″ . .	9¼	67.	10200	14	154.	7700	76.3 %	8.	66	527	66

The cylinder sizes in this table do not represent the proportions used by any particular manufacturer of pumps but are given to illustrate the approximate proportions used in designing pumps for low water pressures and moderately high steam pressures and to show the combined mechanical and hydraulic efficiencies which are practicable.

From the foregoing table and explanation it will be seen that the proportionate areas of steam and water pistons are constant for any given steam and water pressures irrespective of the capacity or piston speed of the pump except as they may vary due to a difference of efficiency; the smaller size pumps, having proportionately more friction losses to be overcome than larger ones, are therefore less efficient, as shown by the table.

The capacity of the pump therefore is the product of the area of the water piston multiplied by its speed or travel within a given period of time.

This is usually expressed in terms of gallons per minute as follows:—

$$\frac{A \times S}{231} = \text{Gallons for one single stroke,}$$

A=Area of water piston in square inches.

S = Length of stroke (or travel of piston during one stroke) in inches, and 231 = Number of cubic inches contained in one U. S. gallon.

Therefore the gallons displaced during one single stroke multiplied by the number of single strokes of the pump in one minute represents the capacity of the pump in gallons per minute.

The above represents the theoretical capacity as usually estimated and direct acting pumps are rated, as to their capacities, on this basis, but actually the capacity is slightly less than this as there are always small losses due to slippage of water past the valves and the deduction on one side of the piston for the area of the rod; occasionally check tests are required when the actual capacity discharged by the pump is measured either by pumping over weirs, through meters or into tanks or weighed by scales. Such tests are made to determine what is termed the volumetric efficiency of the pump which is calculated as follows:—

Actual Capacity as Shown by Test, divided by Theoretical Capacity as Estimated,=Volumetric Efficiency.

For properly designed steam pumps operating at exactly full stroke and with valves and packings in good condition the volumetric efficiency usually approximates 95% and it is also possible with other conditions as described and the pump running beyond its normal or nominal length of stroke that a test may show actual capacity to be in excess of the theoretical.

This is what is called running "over stroke" and is usually of no disadvantage to the operation of the pump providing there is ample clearance space between the cylinder heads and the pistons so that there is no danger of contact between the pistons and the heads and also that there is sufficient clearance space at the ends of the steam cylinder to permit of a proper "cushioning" effect of the steam piston when in contact with the exhaust steam which is shut in at each end of the stroke for this purpose.

The same methods should be applied for the calculation of capacity and steam and water or liquid pressures in considering the duplex type of steam pump except that in this case there are two sets of steam and water cylinders to take into the calculations so that the simplest way to arrive at the result is to estimate one side of the duplex pump the same as though it was a single cylinder or simplex pump and then multiply the capacity by two.

It should be borne in mind when considering piston speed that this is based on the travel or speed of each particular piston separately in feet per minute, for example:—

A duplex pump having a stroke of 12'' (1 foot) and each side making 66 strokes per minute would be understood to have a piston speed or travel of 66 feet per minute, for while there are two pistons, (one at each side of the pump), and each is traveling at the rate of 66 feet per minute, their rate of travel cannot be added together as is sometimes erroneously done and called 132 feet per minute. The fact that there are two pistons in the pump and both displacing liquid at the same time and at the same speed is properly taken into account in calculating the total volume displaced by both pistons as explained above.

CHAPTER IV.

The Crank and Flywheel Steam Pump.

This type of steam pump has certain advantages over the direct acting type which, for some classes of pumping service, are quite sufficient to warrant the higher first cost, which is due to additional parts required in the construction of the crank and flywheel pump.

The usual design provides for a water end consisting of cylinder, valves, piston or plunger and rod of similar design to that used in the direct acting pump, but in addition to the piston rod being carried through to and connected with the steam piston the opposite end is connected with an intermediate crosshead which in turn is linked up with the crank pin by means of a connecting rod.

In Fig. 12, we show a diagram of the simplest arrangement of a crank and flywheel pump, where the steam cylinder A and pump cylinder B are on the same side of the flywheel W and where the steam piston rod is extended to form the plunger rod for the pump.

Fig. 13 shows another arrangement, where the crank-shaft and flywheel W is located between the water cylinder B and steam cylinder A and the power is transmitted to the water piston through side rods connected between the crosshead and the water piston or plunger as shown by the diagram.

Crank and flywheel pumps are manufactured in both horizontal and vertical types; that is, the moving parts may be arranged to operate in either a horizontal or vertical direction; the horizontal type is most commonly used but vertical pumps are often necessary on account of occupying less floor space or for the reason that the water cylinder may be located within a pit or dry well and within suction distance of the water supply, while the steam cylinder is raised up above the pumping cylinder to any convenient height required.

The principal advantage of the crank and flywheel pump over the direct acting pump is that of better economy of steam and therefore the consumption of less fuel for its operation. In addition is that, due to the quicker reversal of the moving parts in starting the return stroke, a more uniform flow of water is secured especially in double acting pumps.

The flywheel pump, with regard to its steam end, is of quite similar construction to the steam engine used for general power generating purposes in paper mills and other manufacturing plants.

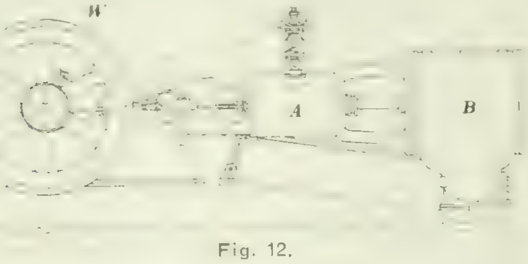


Fig. 12.

The object in developing this type of pump to secure better steam economy is to use the steam expansively while it is passing through the steam cylinder instead of as in the case of the ordinary direct acting pump where the steam is admitted to the cylinder throughout the entire stroke of the pump at full initial or inlet pressure.

In crank and flywheel pumps, where the steam is used expansively, the steam is admitted through the steam valves and into the cylinder throughout the first part of the stroke only and excess power from the initial impulse of the admission of steam at full pressure is transmitted through the shaft into the flywheel which takes up or absorbs it momentarily and returns it again through the shaft and finally transmits this power to the water piston while at the same time the steam inlet port between the steam chest and the cylinder has been closed by the steam valve moving over it and the steam already admitted into the cylinder is expanding, due to the increased volume of the cylinder caused by the piston moving towards the oposite end. By expanding the steam in this manner its power is utilized in most cases until it is discharged into the exhaust port at only slightly above the atmospheric pressure.

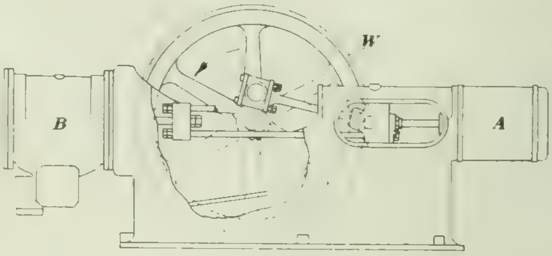
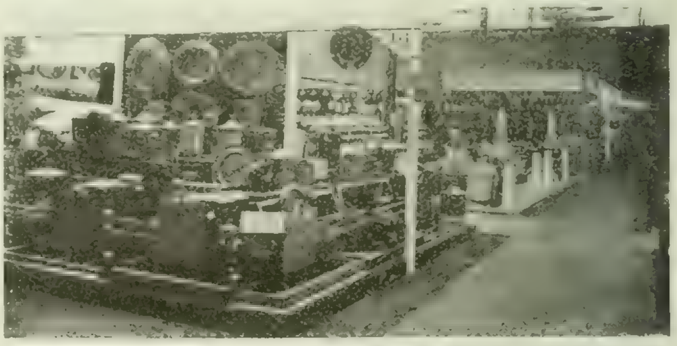


Fig. 13.

The expansion of steam can be illustrated most graphically by means of the steam engine indicator which is an instrument designed to register the steam pressure in the cylinder throughout one or more strokes of the engine according as to whether the operator wishes to make a record for only one stroke, one revolution, or for a number of revolutions.

(To be continued.)



A Typical Booth at the British Industries Fair, described in Pulp and Paper Magazine, Dec. 8.

It is pleasant, indeed, to read in the Port Arthur "News-Chronicle" the careful rehearsal of the history of the dealings of that city with the Port Arthur Pulp and Paper Co. (now the Provincial Paper Mills) and to note the generous tribute to the company for doing more than merely the letter of its agreements. No wonder the city voted strongly in favor of an extension of time for constructing the new paper mill and other features of the new agreement.

Educational Work in the Pulp and Paper Industry

There are few, if any, industries on this continent entitled to greater praise for their educational efforts than is due to the Pulp and Paper Industry. Several year sago it became evident that the demand for night schools and other educational opportunities in pulp and paper centres could not be satisfactorily met without having an authentic text book on which to base the work. The organizations of the technical men in the industry in Canada and the United States appointed a Joint Executive Committee which immediately drew up plans for the preparation of a suitable text and estimated what appeared to be an adequate amount for defraying the cost of preparing the manuscript. Experts in each of the principal phases of the industry were engaged to write the section dealing with their particular department and the necessary editorial staff was engaged for putting the manuscripts in uniform style, in language properly prepared for the printer, and re-written where necessary in order to present the information in the clearest possible manner, which is a vital factor in the success of a text book, particularly one intended for correspondence instruction.

J. N. STEPHENSON
Editor of the Industry's text books.

The whole scheme was something without precedent and on this account, and because the number of necessary illustrations and the work required to prepare them properly was somewhat under-estimated, the original fund of $30,000 which was quite promptly forthcoming from the industry, proved somewhat insufficient. This discrepancy was partly due also to the very marked rise in all values since the preparation of the books was begun. Additional funds are now being raised to complete the work.

Volume 1 was finished in January last and Volume 2 appeared in the spring. Volume 3 is now practically complete and will be available very early in the new year. A large amount of work has been done on Volume 4 and considerable has been accomplished in the preparation of Volume 5. A brief description of the contents will be of interest to all of those connected in any way with the industry and a few words will be added in regard to the manner in which several communities are making use of this text in their educational work.

What the Books Contain.

Volume 1 contains the following sections: Arithmetic, Mathematical Applications, How to Read Drawings, and Elementary Physics. Volume 2 deals with Mechanics and Hydraulics, Elementary Electricity and Elements of Chemistry. It will be seen that these volumes cover the requirements in fundamental mathematics and science on which any successful development of the course of instruction in pulp and paper manufacturing processes must be based. The reason for beginning the series with these subjects is that the committee set out to prepare a complete course of instruction and appreciate the absolute necessity of a proper understanding of these subjects before a study of manufacturing operations can be successfully undertaken. One of the chief handicaps of the rank and file of pulp and paper mill workers is that they have not had a satisfactory grounding in these fundamental subjects, and, therefore, are not in a position to grasp and develop ideas which would advance the industry and improve their own standing and earning power. These subjects have been treated very clearly and as comprehensively as necessary to give the required foundation for further study. Illustrations and examples, wherever possible, are based on actual mill experience. This immediately connects up these subjects with the mill and makes the study not only more valuable, but more interesting.

The Manufacture of Pulp is taken up in Volume 3 and is covered in a more comprehensive manner than has yet been undertaken. An important feature of the volumes is the wealth and the excellence of the illustrations. This is particularly shown in the first section, which deals with the Properties of Pulpwoods, a subject which, heretofore, has not been given the attention it deserves in books written for pulp makers and pulp users. It is particularly necessary for men who would understand manufacturing processes to have a pretty clear notion of the character of the principal raw material. In this section both the physical structure and chemical properties of wood are carefully explained. Another feature of this volume is the section on Wood Preparation. This takes up the various methods of barking, chipping, and screening of pulpwood, and includes information on fire protection and the growth of fungi.

In the other sections on manufacture, the production of mechanical, sulphite, soda, and sulphate pulps is described clearly and with a large number of illustrations of the usual equipment, with full explanation of the operation of each machine. These illustrations are not pictures used for ornament, but carefully prepared line drawings, with parts properly designated. The Treatment of Pulp is a section which has to do with operations common to every kind of pulp, such as screening, de-watering, pressing, drying, etc. The Refining and Testing of Pulp is a section in two parts. Part one describes the principal types of refiners with their object and their result. Part two covers accepted methods for sampling and testing of pulp for moisture and describes methods for testing purity, cleanliness, strength, bleaching quality, etc. Bleaching of Pulp covers the preparation of bleach solution from bleaching powder and by electrolysis, describes the different types of electrolytic cells and discusses the chemical principles involved and the bleaching operation.

Volumes 4 and 5 take up the Manufacture of Paper and here, as in Volume 3, each section has been written by the person particularly qualified from his training and experience with the subject assigned him. Paper mill operations are assumed to begin with the preparation of rags and such other fibres as receive their initial treatment in the paper mill. The necessary equipment is fully described and the cooking and washing processes explained. The treatment of waste papers has assumed a position of great importance in recent years and the subject is adequately covered in this section. The section on Beating and Mixing covers the discussion of the principles, the apparatus, and the processes encountered in the preparation of the material for the paper machines. Furthermore, operations such as Engine Sizing, Coloring, and Loading are treated in separate sections where these important considerations are thoroughly explained.

The section dealing with paper making machines is without doubt the most comprehensive treatment of this subject which has ever been published. The screening of stock is the first matter included and from there the author comes to the explanation of the principles involved in paper making by machine with descriptions of, we believe, every type of paper making machine. Considerable attention is given to the actual operation of the machine, with explanation of the function of each part and including figures on the various factors which influence paper machine efficiency and, of course, including descriptions of the recently developed electric drives.

The manufacture of paper is continued in Volume 5. This volume contains a description of particular merit of the process of making Handmade Paper and with illustrations which cannot possibly be surpassed. This is followed by a discussion of Tub Sizing of paper, both in the form of sheets and in the web. The next section is on Finishing Operations, which includes the handling of paper from the machine to the warehouse and deals with calendars, cutters, etc. There is included a section on Coated and Other Treated Papers, such as vegetable parchment, since in a number of cases these processes are carried on in conjunction with the manufacture of the paper, and the quality of the paper furthermore, is important to their success. The section on the Manufacture of Special Papers, Boards, etc., will contain information with regard to some of the special factors or special conduct of regular mill operation required to produce the desired results Paper Testing is a subject that deals not only with the methods of testing paper for the more important qualities, but incidentally furnishes considerable information on the characters and constituents of various kinds of paper. A chapter on Mill Organization is planned for in order that a person desiring to become acquainted with the industry can be informed as to the various departments of the mill and their interrelation. This is particularly valuable in giving the novice a knowledge and an appreciation of the extent to which the success of the operations in one department depend upon the care with which members of the other departments carry on their work. Under General Mill Equipment we find treated a number of features which contribute largely to the handling of materials, transmission of power, steam, etc. Provision is being made for a chapter on Water and for a section on Laboratory Practice and the Analysis of (the more important) Raw Materials. This volume concludes with a Dictionary of Papers, Useful Tables, and the like. Certain of the sections in Volume 5 are purposely made somewhat flexible as to scope in order to vary them where necessary in order to keep the size of the volume within the limits planned and provided for by the committee and the publishers.

A feature of the books is that they are not only available as bound volumes but they also have been prepared in the form of study papers containing about 50 pages each, for greater convenience to the man who does not want to risk damage or loss of his bound copy and who may want to slip a study paper in his pocket to study at odd moments and to have handy in attending classes. This feature is especially designed also to facilitate instruction by correspondence.

Organization of Instruction.

At least five paper mill towns in Canada are conducting or planning classes in which these text books will be used, and there is at least one community in the Uited States where the first two volumes are already in use. The method of conducting the work and the manner in which the text books serve the purpose vary with the locality. In Canada books are sold in sets and in several cases the companies are assisting the men in purchasing them on the installment plan. The books can be purchased either bound or in pamphlet form and it is possible for a mill to assist the men in purchasing pamphlets where they desire to own them or to purchase the pamphlets for the mill and distribute the appropriate study papers to the men attending the corresponding classes. This practice will doubtless prove helpful, especially at plants where several classes are being conducted simultaneously. It is hardly possible for a man working in the mill to attend more than two classes at the same time, so that the purchase and distribution of the study papers by the mill would relieve the student of having an accumulation of papers which might be lost before his school work had progressed to the point where they would all be required. On the other hand, the pamphlets are punched and can be provided with binders so that a man can equip himself with the whole treatise and take out for immediate use only such parts as his class is covering. The experience of the present winter will provide some interesting and valuable information with regard to the best methods of organization of classes and conducting the educational work.

Sales of the first two volumes are progressing very favorably and there is no doubt but that the excellence of the books and particularly the areatment of the manufacturing processes, will create a demand that will require an early appearance of a second edition. In view of this the committee invites prompt criticism of the work and suggestions for improvement, particularly correction of any error that may possibly have crept into the work.

The distribution of the text is carried on by the Pulp and Paper Magazine, acting for the Canadian Pulp and Paper Association in Canada, and by the Technical Association of the Pulp and Paper Industry, 18 East 41st Street, New York City, for the paper industry in the United States and, in other fields, by the McGraw-Hill Book Company, who are the publishers.

PULP AND PAPER NEWS

Mr. R. O. Sweezey is partner in Newman Sweezey & Co., Ltd., Montreal, a new firm of investment brokers. Mr. Sweezey, who has reported on several pulp and paper properties, will continue his practice as consulting engineer on forestry, pulp and paper, and hydro-electric projects.

Mr. A. A. Hodgson, of McFarlane, Son, and Hodgson, Limited, Montreal, has resigned from the directorate of the Windsor Hotel Company, consequent on the transfer of the control of the hotel to Mr. D. Raymond.

The St. Maurice Sales Company, Limited, Montreal, has been formed to undertake the foreign business in pulp and paper of the St. Maurice Paper Company, Limited. The office is in the Board of Trade Bldg., Montreal.

Water has been run through the Queenston Power House of the Hydro Chippawa system, and the wheels have been officially started. The construction of this waterpower has been for the last two years the big piece of engineering sightseeing in the province. It has also loomed large in financial discussions. The possibility of selling power on a large enough scale to compensate for a capital outlay of $90,000,000 at a price per horse-power year sufficiently attractive seems remote. It looks as if the province will have to absorb some losses. Large blocks of power will be available, however, and should be of assistance to the pulp and paper industry in the range of distribution.

Dividends paid by paper and pulp companies on the first of January totalled nearly $1,200,000 with bond interest amounting to $252,810. In view of the enormous shrinkage in collateral values, the maintenance of dividends in so many mills is reassuring. The general impression in discussion of the situation is that no general upward trend is to be expected, but that the market is approaching a more stable and healthy condition.

We were very glad to note that Mr. J. A. Bothwell, General Manager of the Brompton Pulp and Paper Company, Limited, returned home on Saturday, December 30, very much improved in health.

An accident which proved to be fatal occurred at East Angus on December 23, when one of the employees, Geo. Boisvert of the town was killed while at work on the wood pile. It seems that the late Mr. Boisvert was working at the foot of the wood pile, and a piece of wood becoming loose at the top, fell down and struck him on the head killing him instantly.

More encouraging news is heard regarding the position of the Riordon Company, which was on the verge of liquidation for some months. Since the re-opening of the mills at Kipawa and Hawkesbury, there seems to have been a steady translation of the company's raw materials into a marketable product, sulphite, together with an improving sale of the latter. It is said that the company's indebtedness to banks has been reduced by over $1,000,000 in the last six months, and the reduction is now going on at the rate of over $200,000 per month. It is said that the manufacturing of the wood into sulphite is being carried on at a small profit so that the company's position through patience and economy is steadily improving.

E. J. L'ESPERANCE AT PAPER CLUB.

The Paper Club of Montreal opened this years activities at the Queens Hotel, Wednesday, when E. J. L'Esperance, General Manager of the Imperial Life Assurance Company gave a stirring address on "Salesmanship.". Many phases of salesmanship were touched upon in his remarks; as character, knowledge of your goods and what they would do, service, then pep.

Mr. Reynolds, the President of the Club was the chairman of the Meeting, and a large number of members and guests were enthused by Mr. L'Esperance's remarks. The Club looks forward to a very prosperous year.

LESSONS FROM SCANDINAVIAN FORESTRY METHODS.

Mr. Edward Beck, secretary of the Canadian Pulp and Paper Association, was one of the speakers at the annual meeting of the Canadian Forestry Association, held in Toronto, on January 10. He dealt in an exhaustive fashion with his trip last year to Europe, and the lessons which Canada can learn from European forestry methods and policies. He pointed out that in Scandinavia, the people of all classes were imbued with the importance and economic value of the forests, this being due to the education of the children along lines which lead them to appreciate what conservation meant to the prosperity of the country. Progress was due, in fact, to the existence of an enlightened public opinion. Self interest was the impelling force. In each country Mr. Beck visited, the forest authorities were of one mind that without public opinion back them up they could not accomplish anything.

Mr. Beck described what is being done in Europe to perpetuate the forests, remarking that in Sweden the private forest owners and the State co-operated to this end. Some of our provinces could learn a lesson from this co-operative spirit. Unfortunately it was the practice in Canada for some authorities arbitravily to adopt timber regulations without any regard to the views of the limit-holders, and too often in conflict with what the latter believed to be their best interests or the best interests of everybody concerned. The Swedish method was to call the owners or lessees into conference with the forest service before any changes were made, the result being general acceptance of changes and a ready compliance with the law.

Mr. Beck laid emphasis on the importance attributed to scientific forestry and the training of foresters in Norway, Sweden, and Finland. He also referred to the extensive forestry program adopted in Great Britain and the reafforestation of lands devastated by war in France. He assured the meeting that the members of the Canadian Pulp and Paper Association were keenly alive to the good work being done by the Canadian Forestry Association. He hoped they would continue their efforts, since upon the success that crowned those efforts to awaken and arouse public interest in Canada on the importance of a forward looking forest policy depended not only much of the permanence of the pulp and paper industry, but also much of our national prosperity.

UNITED STATES NOTES

The wages of 10,000 unskilled laborers in the employ of independent paper manufacturers are cut 8 cents an hour, or 20 per cent, by the terms of a decision arrived at by the paper strike arbitration board which concluded its hearings in New York City last week. The reduction takes effect beginning with Monday of this week. This puts the present rate of pay for unskilled workers at 32 cents an hour. The skilled men in the industry receiving 54 cents an hour and upward, retain their old scale of pay. J.T. Carey, President of the International Brotherhood of Paper Makers; John P. Burke, President of the Brotherhood of Pulp and Sulphite Workers, represented the employees on the board, and E. B. Murray, C. H. L. Jones and F. L. Carlisle, the E.B. Murray, C.H.L. Jones and F.L. Carlisle, themamanufacturers, with Judge Frank Irvine, of Ithaca, having the deciding vote. On the final vote, Judge Irvine was with the manufacturers in voting for a 20 per cent cut. The new scale will stand until May 1, when, if either side requests a reopening of hearings, new prices will be considered. Practically all of the large paper companies with the exception of the International Paper Company are affected by the award. The paper manufacturers in asking the reductions argued that they were necessary to reduce production costs and meet declining prices. They pointed out that only about 75 per cent of the industry was operating because of the high labor costs. Dissatisfaction with the award was expressed by the labor delegates.

Difficulties involving striking employees are still being experienced at several of the International Paper Company plants. State troops were called out to patrol the streets of Corinth, N.Y. last week when an automobile owned by an employee of the company's mill there was blown up with dynamite in a barn in which it was stored. The owner of the machine did not leave work with other employees last May when the strike of papermakers, which has not yet been called off, was declared.

At Rumford, Maine, two former International employees were found guilty of contempt of court for violation of an injunction restraining striking workers from interference with operations at the International's Rumford Mill. One of the men was sentenced to two months imprisonment. The other man was freed under a suspended sentence.

The Whitaker Paper Company's new eight-story building in Baltimore was formally opened last week in connection with the eighteenth annual sales conference held there by the well known paper concern. Several hundred of the form's division managers and other representatives were on hand for the usual discussions, informal talks, receptions, inspection tours and other features marking this annual gathering of the Whitaker forces. Some very interesting papers were read in the course of the meetings, and A. L. Whitaker, president of the company, gave an inspiring talk at a banquet held in the Southern Hotel to mark the opening of the new building.

Two new machines designed to fill a long felt need in the paper cement sack line have been completed by the Smith and Winchester Manufacturing Co., South Windham, Conn., and shipped to manufacturers in the South who intend using them for handling the very heavy woodpulp papers. The design embodies among other new features a corrugating device which takes in the entire width of the paper roll.

Following a shut-down lasting for nearly a year, the Moore & Thompson Paper Mill, Bellows Falls, Vt., resumed operations last week. The mill is again in the control of the original owners. Col. Fred. A. Thompson and F. A. Moore, who had sold it in 1920 to the Eagle Paper Company of New York. Kraft and coarse papers will be the main products. Albert T. Buel, of Wilmington, Vt., formerly manager of the Deerfield Pulp and Paper Company, will be mill manager.

The Ideal Coated Paper Company of Brookfield, Mass., the Ware Coated Paper Company, Ware, Mass., and Samuel Jones & Co., Newark, N.J., have been merged and the confined business of the three concerns will henceforth be conducted under the name of the Maclaurin-Jones Company. Home offices of the new company will be in Brookfield. Two of the companies included in the consolidation are considered the largest manufacturers of gummed paper in the country.

A FINE PROGRAMME FOR THE TECHNICAL SECTION

Those who attend the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, at the Ritz Carlton Hotel, Montreal, on January 25 and 26, will be assured of a varied and interesting program, which covers a wide range of subjects. The replies to the secretary's announcement are very gratifying.

The business meeting will be held at 9.30 on Wednesday morning, under the chairmanship of Mr. George Carruthers. After the formal business, Mr. R. A. McInnis will open a discussion on "Where do we stand? Are the problems of our industry developing so rapidly that the technical men are unable to keep pace with them on are technical men in advance of the industry?" Dr. J. S. Bates, and Messrs. W. B. Campbell and R. W. Hovey have promised to give their views on the subject.

After that we report on nominations and elections of officers, and men luncheon.

The following three subjects are down for discussion on the other sessions:

"Safety Devices in Paper Mill Engine Rooms".

The opening session on Thursday will be devoted to a symposium on Felts and Wires. Three subjects are on the program:

"Getting the Most out of Machine Clothing"; and "The Manufacture of Wire Press Mats for Pressing Wet Pulp".

After luncheon, were is a very interesting subject in "The Utilization of Jack Pine in the Manufacture of Newsprint."

The last subject on the program is "The Use of Clean Water as a Preservative for Stored Mechanical Pulp."

The annual smoker will take place Wednesday, from 8 p.m. on.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, January 10. — In any estimate of the immediate future of the pulp and paper industry, particularly in relation to export business, one must give due consideration to the factors which will largely determine the development or otherwise of the industry. Canada secured her present strong position as a manufacturer of pulp and paper owing to the conditions created by the war — we possessed the necessary raw material and water power, together with manufacturing facilities, which enabled us to supply the needs of countries which had hitherto draw the bulk of their requirements from other sources, which were almost cut off for the time being.

This favorable position was bound to terminate sooner or later — it came to an end sooner than was anticipated by many leaders of industry. The period of readjustment which followed involved serious losses. We are now down to a point where Canada is no longer in possession of the advantages due to abnormal conditions, and where our mills have to compete in the markets of the world with countries which formerly did a very large business in pulp and paper, and which possess excellent equipment and good resources. Canada is in fact, up against serious competition.

For the time being, we are under the handicap of having large stocks of pulpwood bought at big prices, although two or three companies—notably the Brompton Pulp and Paper Co.—are averaging the cost of their wood by cutting this winter, at a comparatively low price. These heavy stocks mean that pulp and paper will be produced at a relatively high cost, and that, some of the mills will have to work on a small margin of profit for certain lines. That condition will no doubt pass away in a short time, and the mills will then be in a position to do a more remunerative trade, especially if working costs can be lowered. While this load of high priced wood may act as a temporary handicap, it will not affect the permanent position of Canada as a producer of pulp and paper, and the possesser of unequalled supplies of the necessary raw materials.

Paper jobbers report that business during the past week has been fairly good, and that indications point to a continuance of this condition.

PULPWOOD.—According to one authority, there is not likely to be a shortage in the supply of wood, which is predicted by some dealers, who believe that the present low price will not induce farmers to cut freely this winter. It is true that comparatively little is being bought just now, but this is because of the heavy stocks on hand.

NEWSPRINT.—The position in this department is not too good. The reduction in price, forced on to the companies, does not leave a great margin — and competition is pretty keen.

BOOK PAPERS.—Orders continue to come in at a satisfactory rates. The prospects too are encouraging.

BOARDS.—Very little change is to be reported. Although business is quiet, there are signs of more liveliness.

WRAPPINGS.—A quiet market, with a fair outlook is reported in the wrapping paper business.

ROOFING FELTS.—For the moment there is little trade passing. Buyers of these felts are inclined to press for a reduction in prices, but this does not meet with the views of the manufacturers.

RAGS AND WASTE PAPERS.—There is a variety of rags, with prices low. Waste papers have declined somewhat in value.

Toronto Views.

PULPWOOD is quiet; some pressure being brought to bear on the provincial government to help the settlers by paying freight on pulpwood cut by them, but not moving owing to market conditions.

NEWSPRINT & SULPHITE.—There are few indications of any marked change.

BRISTOLS.—Business can best be described as "spotty"; fair activity has been experienced lately.

COVERS & TAGS.—There has been a little cutting in tags lately but the cause of this tendency is obscure.

TISSUES.—A seasonal quiet pervades this market, following the quite fair holiday business.

PAPER STOCKS.—Most of the present business is to United States points. One jobber returning from the Northern States reports a general tendency to firmer conditions and more business toward end of month. No effort is being made to force the market. Dealers are holding good stuff.

RAGS.—The market is dead.

SHAVINGS.—An offer of $3\frac{1}{2}$ cents in United States funds for hard white shavings, is reported. Soft whites are quoted 3.10 to 3.15 at Toronto.

NEW YORK MARKETS

New York, January 7.—(Special Correespondence)—The first week of the new year has witnessed little change in the paper market in New York. A fairly good routine business is generally reported but buyers have not yet resumed operations in anything approaching usual proportions, and most of the current trade activity involves small quantities of the various grades of paper needed for immediate use. Sentiment in the trade is distinctly firm. Everyone dealing in or producing paper seems optimistic regarding the future, and predictions are numerous that 1922 will prove a year of good healthy business in paper. With most every one confidently looking for the market to open up shortly, there is accordingly little presure being exerted on paper consumers at present, the policy of most paper manufacturers and jobbers being that of holding off until buyers decided to increase their purchasing operations. The tone of paper prices is steady, and in some cases a strong upward tendency is apparent. It can be said that the new year begins with paper prices very well readjusted and stabilized, and it can safely be stated that there is small likelihood of price fluctuatons being as broad this year as during the past twelve month.

Reports that have come from Berlin this week tell of a very interesting paper situation in Germany. It is understood that newspaper publishers throughout Germany are bringing great pressure to bear on the Government to have an absolute embargo placed on the exportation of print paper and wood pulp, owing to the serious scarcity of paper in Germany. It is stated that the scarcity of print paper is so acute that the large newspapers in Berlin and other German cities have been compelled to reduce the size of their issues, and publishers contend that the only way in which they can secure relief is for the Government to institute an absolute export embargo on both paper and pulp.

This situation in Germany is of much interest to American and Canadian manufacturers of newsprint in view of all the reports and talk concerning the tremendous amounts of print paper which Germany had to ship to the American market. Many of these reports inferred that German manufacturers were producing newsprint by the thousands of tons for export to the United States, and that they were planning to "flood" the American market. Now it appears that Germany hasn't even enough newsprint to supply her own domestic needs, and that there is no danger of German competition in the print paper trade assuming any serious aspect. Moreover, it would seem that the numerous reports concerning Germany's large supplies of newsprint have been concocted rather than based on fact.

The newsprint market here is quite firm in tone. Publishers are placing contracts rather freely at the new price basis of 3.50 cents a pound at mills for roll news, and demand is holding up sufficiently to keep mills busy. The trade is anxiously waiting for the December production and shipment statistics as it is believed last month will prove to be the banner month of 1920 for the newsprint industry. Certainly consumption reached a new high market for the year, and paper mills either had to increase their output to take care of the larger movement of paper or else succeeded in liquidating a good part of their surplus stocks.

The leading fine paper manufacturing concern in the States has just announced a new price scale on its watermarked bond and ledger papers. Reductions are made in the high-grade lines, whereas advances are made in the cheaper priced papers. On papers ranging between 25 and 45 cents per pound, reductions of from one cent to about 6 cents a pound are effected, whereas on lines running from 12 to 25 cents a pound, advances of from half a cent to a cent and a half per pound are made. The reason for the advances in the lower priced papers is stated to be the higher cost of sulphite.

There is a steady movement of kraft wrapping papers and prices rule firm at 7 to 7.50 cents a pound for No. 1 domestic kraft, and a cent per pound less on No. 2 grade. Tissues are in less demand though no changes are reported in quotations. Book papers are rather quiet. Publishers appear to be getting along with contract supplies and are not placing many new orders. Advertising in the fiction and trade periodicals is increasing, however, and it seems only a matter of time when demand for book paper will have to broaden.

Boards show little or no change. Boxmakers are beginning to evince more buying interest but demand on the whole is light and board mills are in need of orders. Quotations hold at about last reported levels.

GROUND WOOD—The mechanical wood pulp market exhibits a steady and healthy tone. Consumption of ground wood, from all accounts, is running right along with current production; if anything, it is a bit in excess of the output, and with manufacturers favored by this situation, they are not obliged to press supplies onto the market. Prices incline unmistakably upward, and most domestic and Canadian grinders are insisting on at least $40 a ton delivered consuming plants, with many quotations above this level. F. o. b. grinding mill prices range anywhere from $27 to $35 per ton, depending on the distance between the producing and the consuming point, with the most commonly named figure about $32.

CHEMICAL PULP—Demand for chemical wood pulp at present is very spasmodic and at best of light volume. Paper mills are coming into view as buyers only when immediately in want of supplies, and many of them are managing to get along with contract deliveries in such a way as to preclude the necessity of operating as buyers in the spot market. Quotations are maintained and there is a surprising lack of selling pressure. Such pulp as is held unsold is in strong hands and neither domestic traders nor importers are seeking to dispose of pulp at other than full asking prices. The reason for the firmness in the attitude of sellers is that prices on practically all grades of pulp tend upward. Quotations received from foreign sources show conclusively that present stocks here cannot be replaced at former costs, and this causes holders to demand proportionately high prices for such pulp as they have to offer, although of course papermakers are enabled in frequent instances to buy spot pulp at less than the shipment prices named at primary sources.

News grade sulphite is moving steadily at from 2.50 cents per pound upward at pulp mills, and there is a good call for kraft pulp for which both domestic producers and importers quote between 2.75 and 3 cents. Bleached sulphite holds firm with no present indications of any contemplated price changes.

RAGS—The papermaking rag market is beginning to take on a firmer undertone although demand from mills has shown little or no improvement. The steadier tone seems due to dealers adopting a stronger attitude based on expectations that the market wil soon open up, and it is quite noticeable that fewer rags are being offered by packers. There is a fairly steady movement of roofing rags, which are selling in the East at around $1 a hundred pounds at shipping points for No. 1 packing and 80 cents for mixed satinets, while in the Middle West dealers are reported obtaining up to 1.35 cents a pound for No. 1 roofing and 1.15 cents for No. 2 packing. Old whites are slightly firmer, and old thirds and blues are quotably steady though in very slow demand. New cuttings are wanted by consumers in but small amounts and prices in most cases are tending downward.

PAPER STOCK—Reports generally state that there has been no broadening of demand this week for old paper but it is plain to be seen that the market is firmer in every respect and that prices are pointing upward. Dealers place much emphasis on the sarcity of goods in packers' hands and say the are exerting great caution in booking mill orders involving sizeable amounts of paper of any grade in the fear that if demand increases prices will quickly advance.

OLD ROPE AND BAGGING—While quotations on old rope for papermaking are holding, it is generally admitted by dealers that demand from mills has simmered down somewhat and that the tone of prices is not so firm as recently. This is partly due, it is said, to offerings of some lots of foreign rope at reduced prices. Domestic manila rope is quoted at 4.75 to 5 cents per pound at dealers' points, while foreign rope has sold in certain cases down to 4.25 cents. Old bagging is quiet and unchanged in price, with dealers asking 90 cents to $1 a hundred pounds at shipping points for No. 1 scrap bagging.

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INQUIRIES SOLICITED:

WHAT SIZE?

Very frequently Printers are asked to quote prices on Folders, Booklets, Catalogues, etc. of a specified size which is not economical, owing to the waste in relation to a standard size of paper.

On large quantity editions, it is of course practical, where a particular size is absolutely necessary, or where saving in presswork is possible, to have a special size sheet manufactured for the purpose.

Paper associations and manufacturers have spent much time in the investigation of proper sizes and those who are planning printed matters do well to note the Standard Sizes in different classes of paper stock.

Following is a table of Book and Blotting Paper Sizes—as well as a few abbreviations, terms, etc.

	80 lb. Basis.	100 lb. Basis.
25 x 38	80 lbs	100 lbs.
28 x 42	99 "	124 "
32 x 44	119 "	128 "
	Blotting Paper.	
19 x 24	80 and 100 lbs.	

M. F. — Machine Finish
S. C. — Super-Calendered.

It is a matter of only a few moments to figure how a proposed piece of work will cut from a sheet. Take, for example, a simple leaflet of 4 pages—size of page 6 x 9″:—

Size of Paper Sheet 25 x 38″
Size of leaflet flat 12 x 9″ (before folding)
Divide 12 on 25″ side of sheet=2
Divide 9 on 38″ side of sheet=4

You get an efficient cut giving you eight leaflets, 2 x 4 = 8 out of each sheet, with proper allowance for trim and gripper room on the press.

Or, put in another way, your calculation looks like this:—

25 x 38″
12 x 9″

2 x 4 = 8 out.

Take an apparently small change in size and note the waste, viz: 5½ x 10″ (or 11 x 10″ flat or unfolded):—

25 x 38″
11 x 10″
2 x 3 = 6 out.

Or, with the 11″ into the 38″ side and the 10″ into the 25″ side, giving 3 x 2=6 out.

The slight change in size creates a loss of two leaflets per sheet. This is the reason why your Printer often suggests a change in size in your specifications, viz: to save you money.

Another suggestion on Booklets bears on the printing advantage of an 8-page or 16-page form, which allows a more economical handling of it on the press than if you wanted 12 pages out, for instance. This explains why you generally see the number of pages in a book to be 8 or a multiple of 8 to 16.

—The Crest.

FORESTS OF ATHABASCA DISTRICT ARE VALUABLE.

In considering the available forest resources of Canada it is not usual to include the large areas of tree growth beyond the reach of rail transportation in the Northwest Territories. Within this area, however, according to a report on the Lower Athabasca and Slave River District, just issued by the Natural Resources Branch of the Interior Department, there is a vast amount of timber, mostly along the banks of the rivers and lakes. Unfortunately, a great deal of valuable forest has been destroyed in past years, both through carelessness of travellers with regard to camp fires, and by the Indians, who have deliberately started fires to improve their hunting grounds. This wastage of timber in the north country is extremely deplorable, as in that area, due to the shorter season of growth, reproduction of the forests takes a much longer period of years than in more southerly regions. The saving of the timber in this northern section is of especial importance at the present time, owing to the development which is taking place, and which will require timber for building purposes. While much of the timber is of but small diameter, in the valley of the Athabasca, spruce have been found over 100 feet high and 11 feet in circumference.

The forests, however, are but one of the natural resources, the minerals, such as oil, gas, gypsum, bituminous sands, salt, etc., and the fisheries and agricultural production add much to the potential value of the lower Athabasca district. The route to the Mackenzie district being through this country, much attention has been attracted to it, and it is interesting to know that all available information in regard thereto has been compiled by a government branch. Copies of the above report may be secured from the Natural Resources Intelligence Branch, Department of the Interior, Ottawa.

The Lords' work has always been done with imperfect instruments.—Maclaren.

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When should a man scratch hardest?

Same answer.

There is never any danger about the good man, the man who knows his job and does it. Even in the hardest of times he can manage to get along, for there is always a place for him. To-day when business is not as good by a long shot as it was a few months ago, is the time to do the scratching. There is one point that some men are apt to overlook at a time of depression, and that is the opportunity which lies at their door. When things are booming and all is going well, there is not as close a check on the work at each individual man, but in time of stress every man's work is carefully watched, with the result that the man who does good work and is thrifty of his time and of the company's material, is the man who does not need to worry about holding his job.

Every man with a spark of ambition is looking for advancement. He wants a better job with better money. A lot of men never stop to think that in a period of dull trade, he has the chance of a lifetime to prove to his foreman and his superintendent that he is an A-1 man. There is only one proof, and that is faithful work, which brings the immediate reward of a steady job.

But the horizon is wider than that, for when business picks up again, the men who through the hard times have not only done the work allotted to them, but have done independent thinking resulting in saving of labor, or saving of time, or saving of material, to the company, are marked men—marked for promotion. The man who in these times puts all that is in him, both in thought and manual labor, into his work, is the man that when times get better, will find a more responsible job and a fatter pay envelope awaiting him.

There is a tendency to think too much of the hard times, and to grouch over them and to cast longing eyes back to the boom times, but if a man wants to play the game best for himself; he will cut that out and look to the good times ahead. He will prove to the boss now that he has the ability to handle a bigger job and then when the jobs are going he will get one. The silverlining to the dull times cloud is the opportunity it gives to every man to prove he is bigger than the job he holds.—Broke Hustler.

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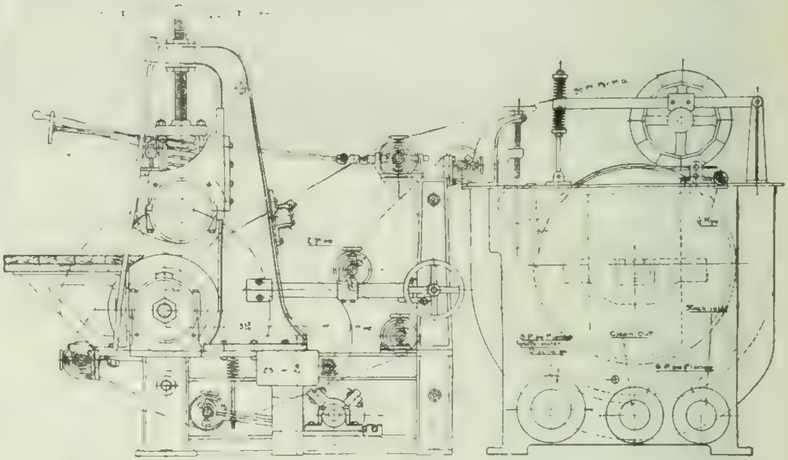

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE, P. Q., January 19, 1922. No. 3

Editorially Absent

Readers of the Pulp and Paper Magazine will doubtless be greatly relieved by the absence of the usual weekly gas attack. For a few issues, there will be a slight curtailment in the number of pages. All available space is being given over to the papers to be presented at the meeting of the Technical Section next Wednesday and Thursday. They should be studied by every reader, and every one who can attend the meeting should bring some bit of information to contribute to the discussions.

For next week we have the papers on "Preservation of wood pulp by storage under water," "Commercial utilization of Jack-pine", and "Powdered coal as fuel in steam plants."

Vancouver is getting civilized. Traffic now follows the rule of the road and turns to the right.

The editor wishes to thank some one for sending in a copy of the magazine for February 10. 1921, for "A College Library."

The Library of Congress, Washington, D.C., wants copies of the Pulp & Paper Magazine for Feb. 5, March 28, and July 22, 1920 (Vol. 18, Nos. 6, 13 and 30).

The series of articles on "Pumps and their characteristics, will be resumed in an early issue. We also have another excellent article on the serious state of Canada's forests which is held up.

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J. NEWELL STEPHENSON, M.S., Editor.

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Transactions[*] of the Technical Section 1922

The Manufacture of Woolen Press Felts

By E. S. BATES, of Bates & Innes, Ltd.

The first question that arises in dealing with this subject is, "Why is sheep's wool most generally used." The chief reasons are its Felting Quality, Strength and Durability, and Resistance to Chemicals. Unlike all other fibres, such as hair and vegetable fibres, the wool fibre is a hollow tube the outside surface of which is serrated. These serrations or scales, with the hollowness of the fibre, account for the felting properties. In the course of manufacture the fibres curl and the scales interlock giving a strength not available in other fibres. The wool fibre as it comes from the sheep's back is full of natural oil, or yolk, and a portion of this oil is retained during manufacture. As it is removed the fibre tends to curl and shrink and felt. The nature of the work it is required to perform in its capacity of a porous belt carrying the liquid pulp through the stages of manufacture into paper, and allowing the water to be drawn or squeezed through without loss of pulp fibre makes this felting quality the most important reason why wool is the fibre most generally used.

This characteristic of the wool fibre varies according to the grade. In a long, coarse wool the serrations are further apart than in a finer, short stock and therefore its felting qualities are less, although the longer fibre gives additional strength to the yarn. The closer woven and smoother the surface of the felt required the shorter and finer must be the wool used in its manufacture, so that in all the different felts used in paper manufacture, from the coarse pulp felt to the fine plate felt, or the fine book machine felt, many grades of wool are brought into use, with a great variation in length of staple, diameter of fibre, felting quality, etc.

Grades of Wool.

Wools from different breeds of sheep differ in length, diameter and strength of staple. In fact, each fleece contains upwards of fifteen to twenty distinct grades of fibre. The grading of wool is therefore a very important part of woolen manufacture. Much of this grading is performed before the wool is marketed, and mills are generally able to purchase, in any quantities required, approximately the types required. Generally speaking, a certain type of wool is bought either in the fleece, skirted, or sorted in a general way and either in the grease, that is, the natural state, or scoured. Grades are classed in a variety of ways. The British system is based on worsted counts, and a certain wool is said to be 36's or 40's, or 60's or 70's, according to its spinning properties, the basis being that, say a 40's quality, is supposed to spin into a yarn 40 x 560 yards in length to the pound of wool, under fixed atmospheric conditions of 19 per cent regain of moisture from bone-dry condition. The American method of classifying wools is somewhat different, presumed to have been developed from the mixed-blood sheep, that is, mixture of the Merino and English breeds. Under this system wools are classified as Braid, Common Low Quarter, ¼ Blood, ⅜ Blood, ½ Blood and Fine. It may be useful to some of you to know the comparative grades. Braid corresponds with the British grade 36's and Canadian Lustre, Common with British 40's & Canadian Coarse or Low Quarter, Low Blood with British 44's-46's & Canadian Low Medium, ¼ Blood with British 50's & Canadian Medium, ⅜ Blood with British 56's and Canadian Fine Medium, ½ Blood with British 60's and Canadian Fine, and American Fine with British 64's-66's and Canadian Extra Fine. The wools used in making felts vary from Low Quarter used generally in manufacture of pulp felts to ¼ Blood used generally in 1st and 2nd press news machine felts, to ⅜ Blood or 56's used in finer felts. Grades are mixed to produce desired results, so that it is impossible more to than generalize in saying what exact grades are used in certain felts. However, the above classification is sufficiently explanatory.

Wools are available to the felt manufactures in the fleece, skirted, that is with the outer edges removed, or graded, and either in the grease as it is removed from the sheep. or scoured, and is purchased by them in all these conditions according as the offering pleases. The wool buyer must know the types he requires, and must look for evenness of quality, strength of fibre, cleanliness, and if the wool is in the grease must be able to estimate shrinkage between that condition and the scoured state. Wools in the grease lose from 25 to 60 per cent in scouring according to type and cleanliness, that is freedom from extraneous dirt. Some wools contain more natural oil than others, fine wools a much larger percentage than coarse wools. So that the buyer must know the "handle" of wools.

Felt wools are produced in many countries. The Eastern Canadian wools contain many grades that are adaptable. England, New Zealand and South America furnish the most of the world's supply. The distribution of this supply has been remarkably developed, so that the woolen manufacturer in Canada has available a supply gathered from all corners of the earth, and by dealing with old-established wool brokers in the wool centres, like London, Bradford, or Boston, is enabled to buy from small hand samples and to know that the shipment will come through as nearly like the sample in uniformity as it is possible to get.

Wool Preparation.

Assuming that fleece wool in the grease has been purchased the first operation is sorting, that is classifying the different qualities in the fleece, according to the grading required. Then comes Scouring. This process is carried out in a series of connected bowls containing warm water through which the wool is raked automatically, coming out on a revolving apron which carries it through the Drier. When dried the wool is allowed to condition, that is to regain normal moisture content, about 12½ per cent. from bone-dry condition in Canada.

The Batch is then assembled comprising the mixture of grades required to make the desired quality of felt. A small quantity of oil is added to facilitate the passage of the fibres through subsequent processes. It is then passed through the Picker where the fibres are disentangled into a soft fluffy mass preparatory to the most important operation of Carding.

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[*] Papers read at the annual meeting of the Technical Section, Canadian Pulp and Paper Association, Ritz Carlton Hotel, Montreal, Jan. 25 and 26, 1921.

Carding further disentangles the fibres, straightening them out parallel to each other and forming the yarn structure. The card consists of a series of three or four large and small cylinders, covered with wire clothing. The base of the wire is attached to leather covering the cylinder, and the points of the wire stick out evenly and vertically from the cylinder. These cylinders revolve in close proximity to one another at varying speeds. The operation is continuous and the wool feeds through between these rolls, until the soft fluffy mass of wool fed into the breaker end of the card emerges from the finisher end in the form of roving, a very loose rope to the required weight, ready to be spun into yarn. This is the basic operation in the construction of woolen cloth.

The next operation is Spinning. In woolen manufacture this is accomplished on the Mule. The process consists of the drawing or stretching of the roving, and spinning or twisting it into yarns. The operation is mechanical. The mechanism is finely regulated, so that the exact draw and twist required can be performed and controlled by definite calculation.

Weaving.

The wool has now been prepared for weaving into the form of a felt. Up to this point the machinery used has been regular woolen mill equipment. But the demands of the paper industry have compelled the construction of special machinery for the operations to follow to produce the heavy-weight, wide felt required on modern paper machines. Mills are generally equipped with a battery of special looms for the somewhat standardized pulp and wet felts, with looms of varying widths for other felts.

The yarn, after being prepared for the cloth to be made, twisted into several ply in the case of pulp felts, is laid out by the Warper according to specifications of length of felt, or series of felts to be made, as width, number of strands of warp yarn to the inch, etc., and is wound on to a warp beam which fits onto the back of the loom. The warp is drawn across the loom, each strand through a heddle, or wire, attached in such a way to the harness, as to automatically rise or fall as desired in the weaving operation. This rising or falling of the warp strands in prescribed fashion forms a shed through which the weft, or filling strands, are passed automatically. The required weave, whether plain, broken twill, basket, or otherwise, is regulated automatically. The warp yarns fold over the weft which is forced forward into place by the Lay, thereby producing the felt or cloth, in a consecutive series of interlocked folds of warp and weft. The width is controlled and maintained evenly by the Reed, an upright comb in the lay, through which the warp yarns have been drawn, and which forces the weft yarns into place.

Necessarily, owing to the heavy-weight fabric to be woven, felt looms are much more strongly built than the ordinary woolen loom. Widths vary from 36 inch reed space to 480 inch, and wider to accomodate the tendency among paper makers to use longer felts. The 36-inch loom is used in the weaving of small jackets, while the very wide looms are used mainly for weaving the endless felt. The limit here is at present around 65 feet in length which in the woven endless felt is the width as lying in the loom. The majority of work however, is done on looms between 175 and 335 inch reed space, the average felt loom being about 280 inches in reed space. The weaving of felts endless is becoming more popular, thereby overcoming the joining process, so that the tendency is toward larger looms. The tension required on the warp yarn and the power required to operate the weft mechanism necessitate a very strongly constructed loom frame so that the modern felt loom is quite a formidable piece of machinery for a woolen mill.

All felts are used as an endless belt and must either be woven as such or joined. The single cloth, that is the felt that has to be joined after being woven, is the simpler, and up to the average widths felts can be woven in this way. Taking an average felt, say 43 ft. by 160 inches, wet felt for news machines, the warp is laid out or dressed with the necessary number of strands to take a filling to make approximately 2½ ounces per square foot finished weight. As the felt is to be 43 ft. by 160 inches when stretched to length on the paper machine, the felt is made shorter and wider, finished size, in the woolen mill. It will be woven in a 312 inch loom 280 inches wide in the reed. Eight to ten picks of filling per inch are woven, a selvedge of about 2½ inches is made and the felt is cut from the loom about 47 feet long, with a one foot fringe allowed on each end for splicing. Four to six felts of the same type and of varying widths can be woven from the same warp without changing the loom, and therefore saving much loss of time. Felts can be woven single to any length, but the width is a determining factor depending upon the available loom width. Woven-endless felts are limited by the length wanted and can be woven to any width.

Woven — Endless Felts.

With a few slight changes made in the loom, a double cloth must be woven to make a woven-endless felt. The laying out of the cloth preparatory to weaving is similar to the single felt, except that the warp strands of the single woven felt become the filling strands of the woven-endless felt. Great care must be taken that the edges are made even, and that the take-up of the upper and lower cloths is performed evenly under uniform tension, so that the weaving in of the warp strands, now filling, will be done evenly in both cloths. As the edges of the cloth as woven in the loom are crosswise of the felt when in operation on the paper machine it is obvious that perfect edges must be woven. This is practically overcome by patent attachments that hold the edges of the felt in place, and with due care from the weaver there is only slight liability of looped or loose edges.

The chief difficulty with felts woven endless is the lack of selvedge. When taken from the loom the sides of the felt are usually sewn or whipped, and if the felt has been made correctly these sides run satisfactorily. However, the strong, evenly woven, reinforced sides of the single-woven felts cannot be duplicated on the woven-endless felt, and very often this factor condemns the latter in the eyes of the paper maker.

Marking Felts.

Marking or Stripe felts are made by the single cloth method with part of the warp of filling yarns of greater diameter and harder twist than the others, the designs being produced by these yarns in combination with a certain weave, such as a check, twill or herring-bone effect. However, the engraved roll is taking the place of the marking felt except where deep impressions have to be made or where the design cannot be too regular.

Joining or Splicing.

Having been measured off to the correct length at the loom the felts are placed over long tables for Burling. All knots are untied, not cut, and the ends are spliced by hand. Mispicks, floats, double picks, etc., are fixed, and the felt is made as nearly perfect as possible. It is then drawn over an elevated roller or Perch and examined against the light. If a woven-endless felt it is then ready to be sent to the finishing room, or to the joining room if a single-woven felt.

Manufacture of Felts.

Joining or Splicing is exactly what the name implies. The work consists of taking the two fringes of warp ends of the single felt and joining them together to make an endless belt. It has to be done so as not only to be unnoticeable but so that it will be practically the same and will wear as well as if it had actually been woven endless in the lom. The operation requires skill. The felt must be joined exactly true to prevent it running obliquely on the paper machine. Experience is necessary to know how wide to make the splice, how tight or how loose it should be, how far to splice by, how close to shear, etc.

The felt is drawn over a slanting table and the two ends are fastened across the centre of the table. The ends are ravelled down to where the weaving is perfect and the filling threads are brought together in proper formation. Starting at one end of the felt the joiner picks up the first warp thread of each end and ties them with a knot six inches from each end of the felt. After doing this she follows along the proper warp thread for about six inches, picks out the warp thread at this point and pulls it through knot and all. Then she ties the next warp threads in the same manner and pulls the knot six inches down in the other direction. The next warp threads are tied and drawn upwards about two inches, and so with the fourth drawn to the lower side, and so on across the felt. In this way the places where the tied warp threads emerge are staggered or evenly distributed. This done across the felt the tops are cut off the loops which have been drawn through leaving free ends about one inch long sticking out from the felt. These projecting ends are spliced by, the loose ends are cut off, and the felt is joined. A detailed description of this operation has been given as this method might easily be employed in the mills for mending holes, one mender being trained who might become very expert, thereby saving time and clothing.

Woven andPressed-Felt Jackets..

Woven jackets can be made on the narrow felt looms. They are woven endless in a 3-5 ply cloth. The yarn is fine, made from fine quality wools, and the warp is laid out with a great many more strands to the inch than felts, and woven with a great many more picks to the inch. The sizes required finished are easily calculated in the lay-out, and the finishing follows somewhat after the regular methods to be described later.

Pressed felt jackets are made by taking the web off the finisher end of the card before being made into roving, and rolling it over a drum to the necessary thickness, and hardening, felting and shrinking to the required thickness, diameter and width finished. These operations require special equipment and great accuracy, but data are available enabling the manufacturer to determine shrinkages and thereby produce the evenly felted jacket with which you are all familiar.

Finishing.

While all the previous operations of laying the structure of the felt are most important it is here that the real work of fitting it for its ultimate uses on the paper machine are performed. The various stocks used in the manufacture of felts give the differently desired results, but the finishing operations are practically the same for all. They include scouring and fulling, called wet finishing, and drying, napping or singeing, stretching and measuring, called dry finishing. It is in the wet finishing operations where the felt receives its felting and characteristic qualities of hardness, softness, resilience, roughness, smoothness, slaziness, etc., and where the size and tension are controlled.

As received in the finishing room the felt appears a dirty, loosely woven, cloth. It contains the oil used in the wool preparatory processes and such other dirt as it has accumulated. It has been loosely woven to a predetermined width and length, wider and longer, as stated previously, than the required measurements finished. The first operation is the Fulling. Here the cloth is felted and shrunk to the required degree. The operation consists of wetting the cloth with fulling solution adapted for the reduction of the oil, and to the quality of wool used, the amount of twist in the yarn, the weave, the desired number of warp and filling threads per inch finished, the tension, the nap and "feel" required on the felt, etc., etc. The cloth is revolved at determined speed between heavy wooden rollrs, folded loosely and evenly to prevent mill wrinkles and to ensure even shrinking. It is watched carefully, taken out several times during the operation for measuring and refolding, and run for from 30 to 90 minutes until it has attained the desired state. The operation is one that requires much experience and skill. While the experienced finisher has general rules to go by each felt demands individual attention. The size as taken from the fulling mill is shorter and wider than that required, to allow for length tension and width tension, that is the difference in lengths and widths between those as the felt is lying on the floor with no stretch to it and those in running.

With the necessary size obtained the cloth is ready to be Scoured. No fulling or felting is wanted in this operation. So as the fulling solution has acted chemically on the oil and other outside substance, a non-alkali, good lather-forming soap is used. The goods are thoroughly scoured and rinsed, then de-watered and dried.

This completes the manufacturing operations in the case of pulp felts, except that in the drying operation the felt is stretched to the required length and width, approximating here the tension it undergoes on the pulp machine, and therefore attaining the exact size wanted. The felting and shrinking of the wool fibres in the fulling and scouring operations has already given a "cover" of nap to the felt, which fills the spaces between the warp and filling yarns and gives the pick-up quality to the felt. In pulp felts strength and porosity are the desired factors. The yarns are very strong, twisted strands and their size necessitates fairly large spaces between the warp and filling threads. These spaces must be filled to permit the easy drainage of water from the pulp without allowing the pulp fibre to get through. If too much cover or napp has been given the felts will fill up quickly and give endless trouble. It is clear therefore that the two factors the felt maker must keep in mind in making pulp felts are sufficient strength to stand the tension, pressure and kicking, and the porosity of the felt.

More cover is required on most other felts to give a greater quality of pick-up, a better diffused porosity, softness, smoothness and finish. This is accomplished on the Napper or Gig. The felt is stretched tightly across the surface of a cylinder fitted with teasels or wires. As the felt revolves slowly against the direction of the rapidly revolving cylinder the attendant carefully applies the surface of the felt against these teasels which pull out the fibres on to the face of the felt. This has to be done uniformly and in such a way as not to injure the felt. The lighter the felt the harder it is to nap. The ordinary wet felt is comparatively simple, but a great degree of accuracy is required with all felts to get the napp even and uniform. The third press news felt also requires care to obtain the necessary smooth surface required to give surface to the paper.

This completes the manufacturing operations. Felts should be allowed a week or so to "set" then should be re-measured and stretched before delivery to the paper mill. The folding is done in a manner best suited to the handling of the felt on the paper or pulp machine, as the case may be.

In wet press and second press news machines felts, the qualities of strength, pick-up and porosity are what are desired. Necessarily a strong course wool is used. The third press news felt must add finish as an important factor, so that a finer quality wool and finer yarn is used, also a smoother weave, to ensure a smooth even surface to the felt. This relation exists between these felts on each class of machines for the various main grades of paper. Naturally there could be even more variety, and perhaps this feature is given insufficient attention, but standardization and speed are determining factors. The result is that the felt maker looks for the average uses for which each grade of felt is required and endeavors to fill the conditions met with there.

Pulp felts and news machine felts are fairly standardized. Conditions in different mills vary slightly, but hardly sufficiently to affect the operation of felts. As the higher speed machines have been developed conditions have necessitated stronger, therefore coarser, wools, larger yarns, less strands of warp and filling per inch, greater porosity, etc., and therefore standards have changed. These are all determining factors and if properly understood the felt maker should meet conditions. Some mills "nurse" felts, other "drive" them, hence varying "runs" in different mills; but with presses and rolls running true, and with equal conditions of operation standard "runs" can be obtained.

The Performance of Felts.

The variation in "runs" between individual felts made in a series and run on the same machine has always been difficult to understand. Here the "human factor" enters, but it can be taken for granted that the felt maker has all the evidence on his side where such variation exists. The wide-awake felt manufacturer will notice any weakness in the felt before it leaves his mill. His facilities for detection of such are almost infallible, and he can make better use of a spoiled felt before it leaves his mill than after it has been returned from a paper mill perhaps after several days running.

Mill wrinkles produced in fulling give endless trouble on the paper machine, but a felt containing them should never leave the mill. Uneven joining is another fault, easily detected. But, if the felt-maker has not determined the strength required, the degree of porosity, the resilience, the hardness or softness, and the finish, you will have trouble and he will hear about it. These are factors every paper mill should be interested in determining, and they can be determined to a very useful degree. The exact measurements of felts required should be known, that is the exact lengths and widths on machines with allowances for stretch and shrinkage, leaving it to the felt-maker to know the floor size. Properly made felts of the proper size to suit the machine for which it has been built should first lengthen and narrow out slightly after it has been wetted and stretched and run for a few hours, then gradually widen out until set, and should hold this size fairly accurately until worn out. The variation in quality of stock and unavoidable mechanical imperfections prevent this from being absolute, but this is the desired result. This applies to all felts in more or less degree according to their quality. The finer quality and weave a felt is, the more set it should be when it leaves the felt mill, and therefore there should be less variation on the paper machine.

Strength of Felts.

The element of strength in a pulp or paper machine felt is determined by the conditions to be met with in use. As previously stated the qualities of a felt are strength, porosity, pick-up, hardness, softenss, smoothness and finish. The tensile strength is dependent largely upon the degree of other qualities desired. Naturally the paper-maker is looking for the strongest felt he can get to enable long runs, but his conditions also compel him to insist upon the other qualities, and these qualities of nap, porosity, and finish produce limitations on the felt-maker in his consideration of tensile strength. "Felt-marking" is a fault that must be guarded against continually. This factor places a decided limitation on the felt-maker.

The quality of strength is determined by the length and strength of the wool fibre, the diameter of the single yarn, the twist of the yarn, the ply of the yarn, the number of strands per inch of warp and filling, the type of weave, and the finish required on the felt. Where strength and porosity are the principal qualities considered, as in the case of pulp and wet press news machine felts, the ordinary "one and one" plain weave is employed. This gives porosity. In pulp felts, where marking or crushing of the stock is of only passing importance, a long fibre stock is used, tightly twisted in the single, and then again twisted to from 4 to 10 ply yarn in the warp and 2 to 6 ply in the filling. Little nap is required, other than the cover obtained in the fulling operation. But in the news felt, while a somewhat similar wool can be used, the felt must be softer, with more cover or nap, and, having to do with a much thinner stock, the felt must be much smaller mesh, requiring single yarn of medium twist to prevent crushing, and the plain weave is employed to give the desired porosity. Naturally the tensile strength is less than in the case of pulp felts, but the relation here between tensile strength and porosity and finish of the felt is the item of greatest consideration.

Better Service by Co-operation.

As smoothness and finish become of greater importance finer wool must be used, yarns become smaller in diameter, the weave is changed to a smooth flat broken twill, porousness becomes an item of less consideration, and softness, cover and finish of greater importance. In these days of competition and speeded production the danger of sacrificing these other qualities for strength and increased runs is very great. Of course, the desired result is a strong, smooth-running felt. Perhaps the stress laid upon the relation of desired qualities will emphasise the importance the felt-maker attaches to intelligent criticism of his felts in operation. And perhaps you will look for faults in this relation in your consideration of and report on felts giving unsatisfactory service. Co-operation of this nature will produce results in more standardized felts, longer runs and better service.

The high speed machines developed in recent years have called for increased tensile strength in the felt, and increased porosity, particularly in the wet and second press felts, but the limitation has persisted in the necessity for providing a napped felt to provide pick-up and sieve qualities and a sufficiently soft surface to prevent crushing. Increased suction has also been a factor to contend with. The demands of speeded up production have been difficult to contend with, owing to that relationship between strength, porosity and finish which the felt-maker must always keep in mind.

Naturally, felts fill up and require washing, frequently or otherwise as the case may be, according to the nearness to perfection the felt has been made in the relationship of the desired qualities. However, this subject is left for your discussion and our enlightenment. There is no doubt that a better understanding of this relationship by paper-men, and the passing on of information to the felt-maker will tend towards perfection, and do away with many troubles encountered with felts in operation. So far as the paper maker is concerned this relationship is the cause-all and end-all of felts. If the felt-maker with only a limited and cursory knowledge of paper-making has to grope round for his information his experimenting might prove expensive and unproductive of results. It is to everyone's advantage to effect all possible improvements.

Money From Steam

By R. L. WELDON, M. Sc., Three Rivers Pulp & Paper Co.

The essential problem in the use of steam in the paper mill is one of economic utilization, for, in the final analysis, it is the dollars and cents cost per ton that is the fundamental consideration. 'Dollars'', because a very appreciable percentage of the conversion cost is chargeable to steam account: 'cents', because profits are often made through the elimination of small wastes. This problem of steam has been becoming of increasing importance in recent years, due not only to rapidly increasing importance in recent years, due not only to rapidly increasing costs of fuel, but also due to greater difficulty in obtaining fuels of relatively good heating value for the money spent. While this last year has seen a distinctly downward trend in the price of fuel, it has also seen quite as distinct a trend in the price of paper; and, as a matter of fact, the percentage relationship of the cost of steam to the selling price of paper is probably higher today than it was during the period of peak prices for coal.

The most important use of steam in the paper mill is that of drying the paper. Linked intimately with the use of steam for drying is the question of power, since, in many mills, it is customary to generate a certain amount of the power required by means of steam, the exhaust being used to dry the paper. This leads us at once to the question of exhaust steam drying versus live steam drying. This is a question upon which it is not only difficult but dangerous to generalize. In order that we may make certain comparisons between these two methods, it is proposed to work about a hypothetical case of a 150-ton mill. The paper mill which we have considered is a two-machine mill making standard news. The machines are 164 inches wide, trimming a maximum of 152 inches, and they will produce 150 tons of finished newsprint per day, when operating at a speed of 900 feet per minute, with a machine efficiency of 85.6 per cent. Some form of electrical sectionalized drive is assumed to drive these machines. This merely means that the power which we may generate as a by-product from the steam used for drying is converted into electrical energy, and the question of sectionalized and mechanical drives does not enter here. The presupposition of the availability of hydro-electrical power at a reasonable price also exists.

A mill of the above size, if a complete self-contained unit, will require about 2,500 electrical horse power on the low tension buss. This will vary slightly with the physical characteristics of the mill site, the general layout or routing of the processes, and the type of equipment used. Of this amount some 1750 H.P. is required for process work, such as paper machine drives, stock pumps, agitators, and other purely process machinery; the remaining amount, 750 H.P., is absorbed by the mill auxiliaries, such as the boiler house, ventilating fans, fresh water supply, etc. Subsequent comparisons are based on this requirement for power.

There are, naturally enough, numerous opinions as to the best method of drying newsprint. The general concensus of opinion seems to point to the use of fairly low pressure steam in the dryers, usually 5 to 10 lbs. (gauge), and that the steam should be sent to the dryers as nearly dry and saturated as possibue. Obviously, practically all the heat available for drying purposes is the latent heat of the steam made available by its condensation in the dryers. Thus any moisture in the steam is useless and at the same time objectionable, since it increases the volume of condensate to be handled to no useful purpose. The use of superheated steam has not been found satisfactory where any degree of temperature control is aimed at, since condensation of the steam cannot take place at the temperature of superheat, whereas in the case of saturated steam, condensation does take place at constant temperature, which readers feasible accurate temperature control.

The amount of steam used in drying newsprint still seems to be somewhat of a variable quantity. The average steam consumption per pound of paper as on the machine varies from 3 to 3½ pounds of steam, and, in rarer cases, consumptions as low as 2.8 and as high as 4 pounds have been recorded, all on relatively modern machines. The important factors affecting steam consumption for drying are:—

1.—THE MOISTURE CONTENT OF THE PAPER ENTERING THE DRYERS.—For a given dryness of the finished paper, the moisture, which must be evaporated from the paper, will vary directly as the moisture content of the sheet entering the dryers and so will the steam required for drying. A two per cent saving here amounts to between five and ten cents per ton of paper.

2. THE EFFICIENCY OF THE CONDENSATE EVACUATION SYSTEM.—This is an important point

which can only be obtained by careful initial planning and proper care during operation. Too much emphasis cannot be laid upon the importance of good circulation of steam, constant removal of condensate from all the dryers, and proper mechanical condition of the apparatus used.

3.—VENTILATION.—This is a fruitful source of inefficiency in the drying of paper. Essentially the steam arising from the dryers should be conveyed from the surface of the paper as rapidly as possible. The conveying medium which is used is air, which is only efficient when it is worked to capacity but not overloaded. It should be provided in proper quantities, at proper temperatures, to the proper points where it is to be utilized. On picking up its load it should not be allowed to 'stall' but should be rapidly removed to the outer atmosphere. Failure to satisfy this last particular often causes double drying to occur with its attendant increase in steam used.

4.—CONDITION OF DRYERS, BOTH INSIDE AND OUTSIDE.—Careless use of oil and poor oil separators on engine driven machines will cause a lowering of dryer efficiency should the inside of the dryers become coated with oil. The accumulation of 'fluff' and other foreign substances upon the surface of the dryers is not conducive to low steam requirements.

5.—THE AMOUNT OF DRYER SURFACE.—It is important that the amount of dryer surface be sufficient for the transmission of the heat necessary for drying, without the use of excessively high temperatures, which not only burn and weaken the sheet but also cause increased radiation losses. Since radiation is dependent upon the amount of surface as well as the temperature difference it is equally important not to go to the other extreme of having too much dryer surface.

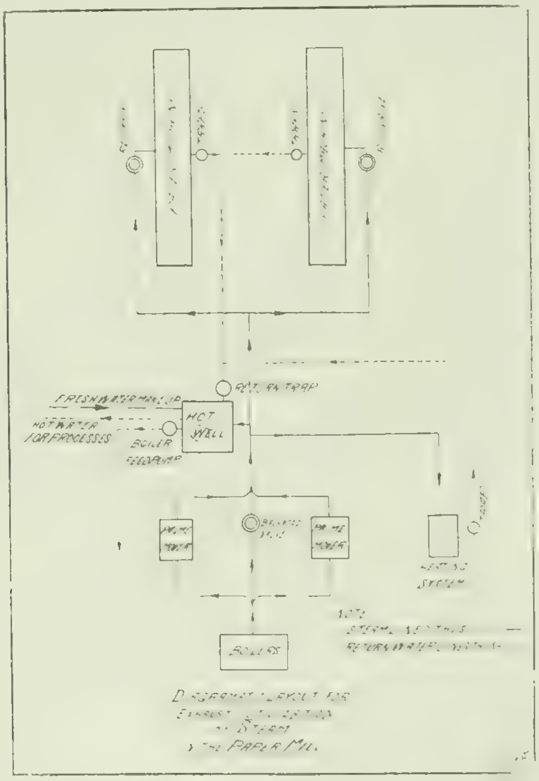


DIAGRAM I

6.—FELT DRYERS.—These are usual on most machines but are occasionally omitted, a proportional increase being made in the dryer surface. The main thing is not to attempt to dry paper with 'wet' felts.

7.—CLOTHING.—The age, condition and weave have an appreciable effect on drying efficiency.

It will be interesting to see in a general way how the actual steam consumption compares with what we might expect as an ideal under the present method of drying paper. The following formula expresses the ideal steam consumption per pound of paper, as on the machine for a given condition.

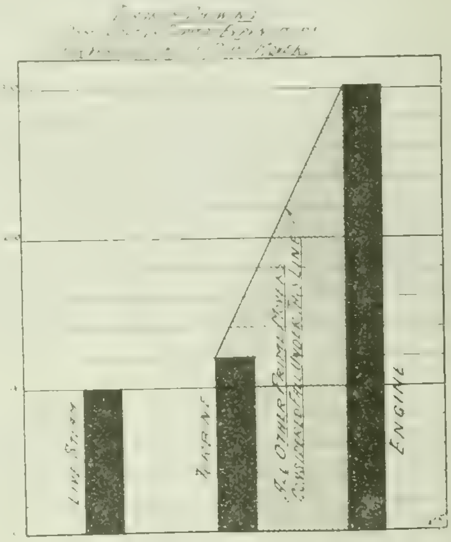


DIAGRAM II

$$S=\frac{\left(\frac{P_2}{P_1}-1\right)(32+H_2-t_1)+1732.5\frac{t_2-t_3}{G_2-G_1}+0.31(t_2-t_1)}{970.A}$$

When—

S =Ideal steam consumption, lbs. from and at 212 deg. F., per lb. paper.

P_1=Percentage of bone dry stock in paper entering the dryers.

P_2=Percentage of bone dry stock in paper leaving the dryers.

t_1=Temperature deg. F. of paper entering dryers.

t_2=Temperature deg. F. of air leaving dryers.

t_3=Temperature deg. F. of air entering dryers.

H_2=Total heat B.T.U. per lb. in water vapor or steam (from steam tables) at t_2.

G_1=Grains of moisture per lb. in air entering the dryers (from psychrometric chart).

If we assume the following data as a representative average for mill conditions, we obtain a figure which represents closely the ideal steam consumption under these conditions.

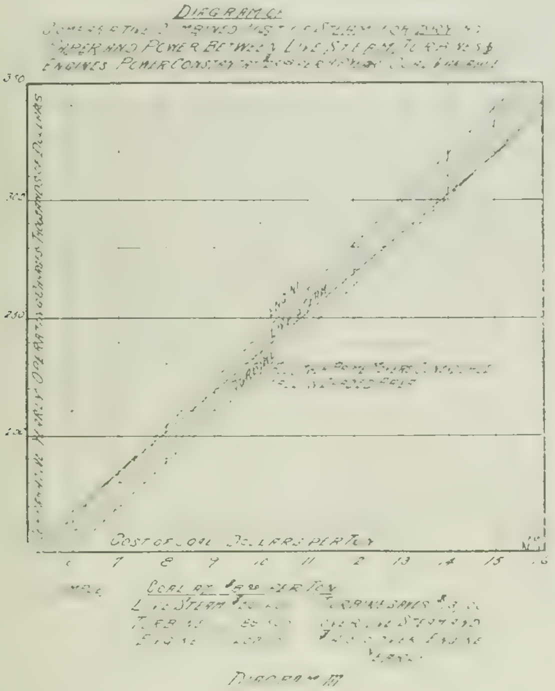
1. Paper enters the dryers 30% bone dry=P_1
2. Paper leaves the dryers 91.5% bone dry=P_2
3. Paper enters the dryers at 65 deg. F.=t_1
4. Air leaves dryers at 120 deg. F. (=t_2) and 80% relative humidity.
5. Air enters dryers at 70 deg. F. (=t_3) and 60% relative humidity.

Then S, the ideal steam consumption, will be 2.75 lbs. of steam per lb. of paper. The conditions assumed are not ideal and might possibly be bettered slightly, with very careful control. Referring back to the figures mentioned for actual steam consumption, we see that the probable drying efficiencies vary from a maximum of 98 per cent to a minimum of 69 per cent. This is given in order to show what probabilities exist for savings in this direction.

The steam flow lines are shown in the accompanying diagram I. There is nothing peculiarly different to this flow diagram. We have shown an exhaust steam connection to the hot-well. The hot-well is of the closed pressure type, exhaust steam being used to maintain the pressure and temperature. The advantages of doing this are:

First—A high boiler feed water temperature is maintained, the feed being at 250 deg. F. instead of 180 deg. F. such as given by the average open hot-well.

Second.—An increase of steam flow through the prime mover is effected, with its consequent increase in power available without serious effect on the heat balance.



Third.—The usual evaporation losses attendant on the use of an open hot-well are done away with, together with a distinct saving in the percentage of makeup water required.

The appended table shows in some detail typical heat balances for a live steam, a turbine exhaust, and an engine exhaust drying system. A large number of these heat balances were worked out, based on data supplied by reliable manufacturers of practically all the various types of engines and turbines suitable for operating at the back pressure required. The heat balances given represent the two extremes, and practically all the other results fall between these two balances. The turbine which is a simple impulse wheel was found to be the cheapest prime mover in first cost and in coal used, the lightest in weight and smallest in space requirements and had the highest steam rate producing the least amount of power. The engine which is of the uniflow tpye was found to be the most expensive in first cost and in coal used, the heaviest in weight and largest in space requirements, and had the lowest steam rate, producing the greatest amount of power. All prime movers considered are compared on delivery of the same amount of heat in the exhaust steam.

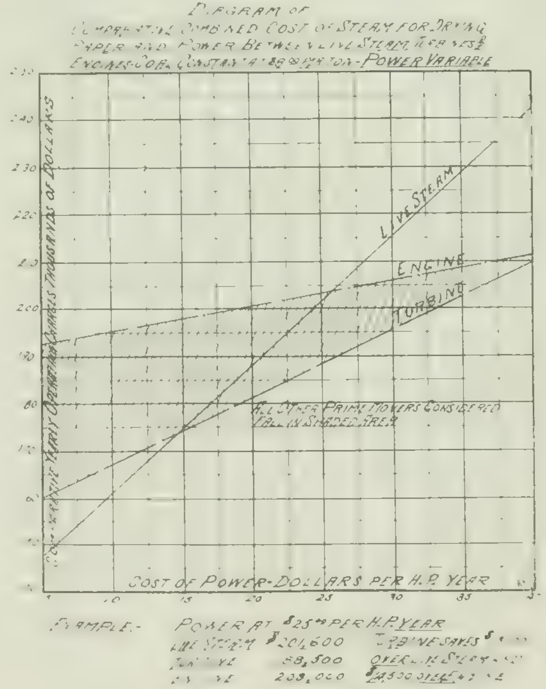
It is to be noted that the assumption of a steam flow of 40,000 lbs. of steam at 5 lbs. (gauge) corresponds to 2.71 lbs. of steam from and at 212 deg. F. per pound of paper as on the machine. This figure was purposely made less than the theoretical figure to ensure the fact that we were working with the minimum flow of steam and thus we could depend on the availability of the power from the prime mover at all times. It is also assumed that all power made available under this minimum condition is utilized by the paper machines and their auxiliaries, for in no case is the minimum power developed less than that required to drive the machines. Thus it is held that comparative cost figures based on these heat balances will show minimum differences and that in practical operation they would be somewhat bettered.

In order to make a proper comparison of these three heat balances in regard to annual operating charges, it is necessary to consider.

1. Capital charges; 2 Interest; 3 Depreciation; 4 Repairs; 5 Labor; 6 Fuel.

The comparative capital charges necessary for the equipment installed are shown in Diagram II. Diagram III shows the comparative annual charges when the cost of coal varies from $5.00 to $16.00 per ton, with power constant at $25.00 per horse power year, while Diagram IV shows a similar curve when the cost of power varies from $5.00 to $40.00 per horse power, with coal constant at $8.00 per ton. From Diagram III we see that, when power remains constant at $25.00 per H. P., coal must cost at least $14.75 per ton before the live steam method commences to become cheaper than the use of exhaust steam from the turbine, and also from Diagram IV with coal constant at $8.00 per ton power must not exceed $14.90 per H.P. to make the live steam competitive with the turbine and exhaust steam.

In connection with this, it was thought that Diagram V would prove of interest, in that it forms a simple means of determining the cost per ton of paper for drying. All that it is necessary to know is the cost of steam per 1,000 lbs. for the previous month. The explanation of the method of using it is to be found on the diagram. It may be used, particularly in the enlarged form, to create interest, possibly rivalry, among the operators, for by its means it is a very simple matter to keep either a daily or tour log of cost for drying paper on each machine. Again it shows the Sales Department, in a concrete manner, the cost of narrow trim. Needless to say, the diagram can be developed for other ranges of the variables than those given, to suit any machine and paper.



Second in importance to the use of steam for drying is the use of steam for heating. Due to the large quantities of air required to act as a vapor conveyor, the steam required for heating is an important item. During cold weather in order to make the use of our air conveyor possible, it is necessary to raise it often through a range of 90 degrees F. and occasionally even higher. This makes quite a hole in the coal pile. While it is not proposed to go into the details of heating and ventilating a paper-machine room, the greatest of care should be taken in laying out a heating and ventilating system, not only from the point of view of its efficiency in removing vapor, but also from the point of view of its possible heat economy. At present heat reclaiming devices are rarely resorted to, perhaps due to the fact that their success is still somewhat questionable. The best possibility seems to be in Control. Careful operating control, adapting the system from period to period and even day to day to suit the variables which affect it, as they change, will help to make a smaller hole in that coal pile.

Referring to control, all the care in the world applied to the previous features will not make up for lack of control in the general use and abuse of steam by men in the mill. Leaky joints and valves in steam lines, careless use of the steam hose, and the hundred and one small uses around a mill soon throw away potential profits.

Three general suppositions have been made from a bread, practical view-point of the Engineer's value in the operating organization.

1st.—Sectionalized paper machine drive controls but one condition. Without control of stock going on to the wire, without control of the amount of moisture in the paper entering the dryers, without control of the steam in the dryers, and without control of the amount of moisture in the finished paper, the drive in itself is only partially efficient from the mill point of view. In order to bring the drive to its ultimate efficiency, these questions of stock, moisture in the paper, and steam in the dryers must be held in constant control. This is the practical province of the Mill Engineer.

2nd.—The Cost Department, from the point of view

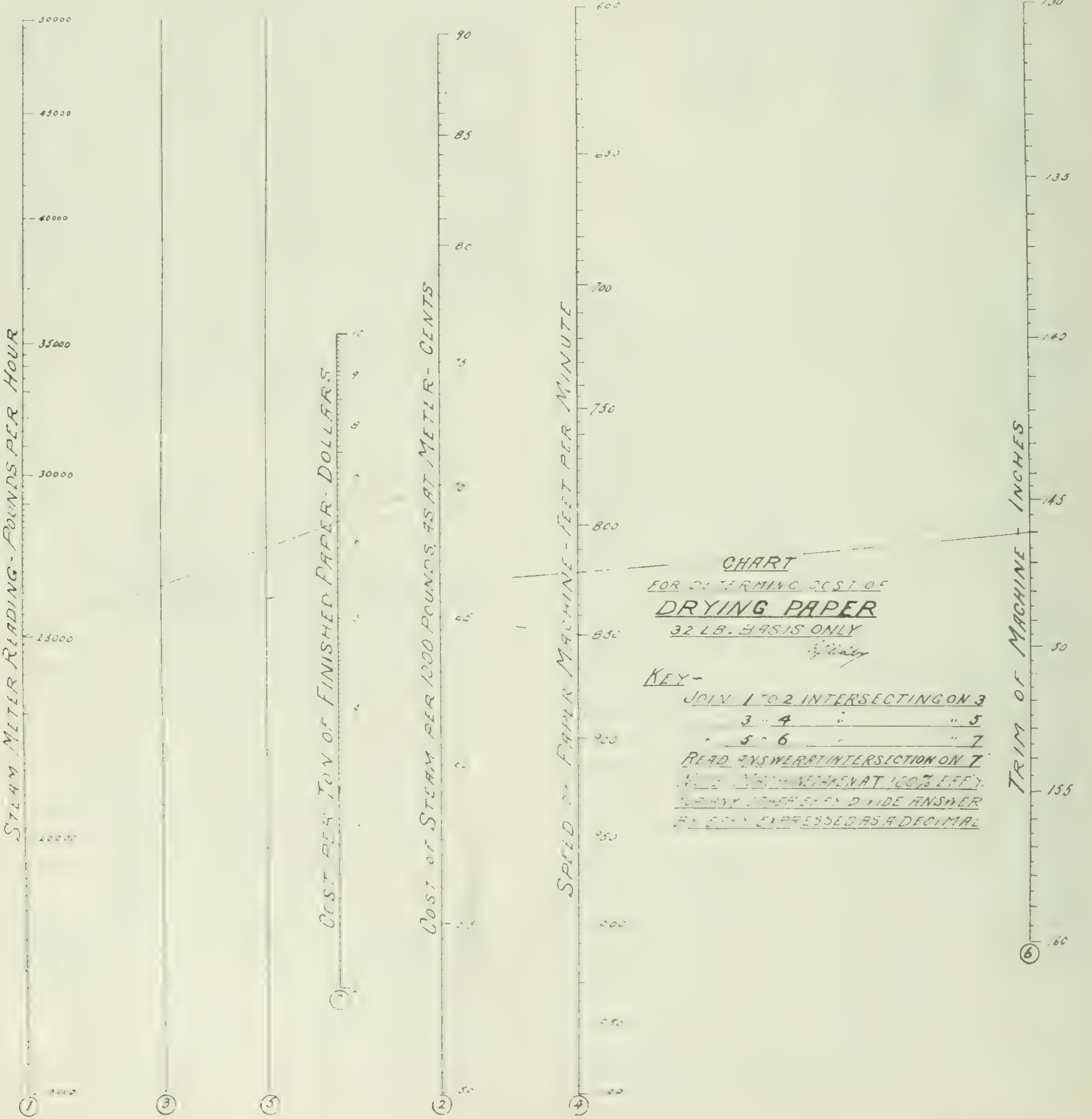


DIAGRAM V.

of the Mill Superintendent, is always fifteen days late. How to bring about a cordial feeling of a desire for cooperation by the mill men with the Cost Department is also the province of the Mill Engineer.

By reducing his formulas from a technical basis to a practical picture, he is making an effort to interest the layman in his own department, but in layman's language. For that reason, the chart (Diagram V) shown has been developed, and no engineering formulas are shown definitely to muddle the operating man's mind who has got to keep in constant touch with the actual costs.

3rd.—The other consideration given this problem, and on which any work in connection with this is predicated, lies in the fact that there is only one real efficiency — Dollar and a Quarter Results from a Dollar Investment.

And the best help any one in the mill can give the Sales Department is Low Cost Production.

COMPARATIVE TABLE OF HEAT AND POWER DATA

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PRIMARY CONSIDERATIONS OR ASSUMPTIONS NECESSARY TO FORM A BASIS FOR THE COMPARISONS

Note:- All pressures given are gauge.

Drying

(1) Amount of paper 154" wide, passing over the dryers at 900 ft.per min., for 2 machines, lbs. per hour	14,800
(2) Minimum steam flow req'd.to dry paper, steam at 5 lbs.dry and saturated, lbs. per hour	40,000
(3) From (2&1), minimum steam from and at 212 deg.F., lbs. per lb.of paper as on the machine	2.71

Power

(4) Total electrical H.P. req'd. on low tension buss to operate mill	2,500

Pressures

(5) Line drop between boilers and prime mover or reducing valve, lbs.	5
(6) Final pressure of prime mover, lbs.	15
(7) Initial pressure on dryers, lbs.	5
(8) Final pressure on dryers, lbs.	0

Radiation Losses from Piping, etc. These, with properly proportioned thicknesses of pipe coverings, will be practically the same for all cases. The losses given are based on fair average lengths and sizes of pipe.

(9) Loss in boiler house lines,B.T.U.per hour	30,000
(10) Loss in line to red.valve " " "	50,000
(11) Loss on closed hot-well " " "	45,000
(12) Loss in L.P. line to dryers, B.T.U.per hour	40,000
(13) Loss in hot water return to hot-well, B.T.U. per hour	30,000
(14) Loss in boiler feed line, B.T.U. per hour	30,000

Boiler House

(15) Average year round efficiency	0.70
(16) Average heating value of coal, B.T.U. per lb.	12,500
(17) From (15 & 16), Equiv.evap.from and at 212 deg.F., lbs.	9.02
(18) Coal req'd. per B.H.P. hour , lbs.	3.83
(19) Coal req'd. per B.H.P. year (310 days of 24 hrs.), tons	14.26

Miscellaneous

(20) The effect of make-up water is similar for all cases and may therefore be neglected.

(21) All the steam is condensed in the dryers; this is usually not quite true but since the condition would be similar for all cases the results remain comparative.

[illegible]

Prime Mover Considerations	Live Steam	Turbine	Engine
(22) Steam req'd.per elec.H.P.at L.T.buss, lbs.	---	38	21
(23) Initial pressure, lbs.	---	200	225
(24) Back pressure, lbs.	---	15	15
(25) Initial superheat, deg.F.	---	100	150
(26) Dryness factor of exhaust as specified by the manufacturer	---	10	[illegible]
Auxiliary Considerations			
(27) Boiler pressure, lbs.	100	205	230
(28) Dryness factor leaving boilers	0.98	Superheated	
Deductions from Previous Considerations			
(29) Initial superheat req'd.at boiler to give that req'd.by prime mover for line drop of 5 lbs., deg. F.	---	98.8	148.8
(30) Radiation loss to prime mover or red. valve, B.T.U. per lb.	2	2	2
(31) Add'l.superheat req'd.at boiler to make up for (30), deg. F.	---	3.8	4.0
(32) Total superheat at boiler, deg.F.	---	102.6	152.8
(33) Heat per lb. at boiler, B.T.U.	1171.2	1261.0	1289.6
(34) Heat per lb.at prime mover or red. valve, B.T.U.	1169.2	1259.0	1287.6
(35) Latent heat per lb.exhaust,B.T.U.	---	945.1	926.2
(36) Add'l.steam req'd.to supply radiation from closed hot-well, lbs.	---	47.6	48.6
(37) Add'l.steam req'd.to supply radiation from L.P. line, lbs.	---	42.4	43.4
(38) Radiation loss per lb.L.P.line,B.T.U.	1.0	---	---

	Live Steam	Turbine	Engine
(39) Heat per lb.entering dryers,B.T.U.	1169.2	1163.9	1145.0
(40) Actual steam req'd.to dry paper, total heat at 5 lbs.press.divided by (39) multiplied by (2), lbs.	39,600	39,735	40,400
(41) Radiation loss per lb.returns, B.T.U.	1.5	0.75	0.75
(42) Temp.leaving dryers, deg.F.	212	212	212
(43) Temp.returns entering closed hot-well, deg. F.	---	211.25	211.25
(44) Heat per lb.returned to closed hot-well, B.T.U.	---	179.25	179.25
(45) Total heat ret.to closed hot-well,B.T.U.	--	7,122,500	7,241,700
(46) Heat per lb.in water of closed hot-well if maintained at exh.press.,B.T.U.	---	218.8	218.8
(47) Total heat req'd.in returns, B.T.U.	---	8,694,000	8,839,500
(48) Add'l.heat req'd., B.T.U.	---	1,571,500	1,597,800
(49) Add'l.exhaust steam req'd., lbs.	---	1660	1725
(50) Total steam flow from boilers, lbs.	39,600	41,485	42,217
(51) Heat per lb.leaving closed hot-well,B.T.U.	--	218.8	218.8
(52) Radiation loss per lb.returns,B.T.U.	1.5	0.75	0.75
(53) Heat per lb.returns entering boiler, B.T.U.	178.5	218	218
(54) Total heat delivered by boiler B.T.U.	46,380,000	52,313,000	54,443,000
(55) Total heat ret.to boiler,B.T.U.	7,069,000	9,044,000	9,184,000
(56) Total heat developed by boiler,B.T.U.	39,311,000	43,269,000	45,229,000
(57) Factor of equiv.evap.from & at 212 deg. F.	1.023	1.075	1.105
(58) Total equiv.flow.from & at 212 deg.F., lbs.	40,500	44,600	46,650

	Live Steam	Turbine	Engine
Boiler House			
(59) Boiler horse power developed	1173	1292	1350
(60) Coal per hour, lbs.	4493	4950	5170
(61) Coal per year, tons	16730	18425	19250
Power			
(62) Total horse power available from steam, at L.T. buss	---	1090	2010
(63) Total horse power to buy at L.T. buss	2500	1410	490
(64) Transformer loss	70	35	10
(65) Motor generator loss	140	---	---
(66) Total horse power to buy	2710	1445	500

The Use of Fuel Oil

By T. S. REMSEN, St. Maurice Lumber Company.

When we look back not more than ten years and compare industrial conditions then existing with those of to-day we are amazed; the world we live in is so changed, that more than a generation might have passed. It is not so long since wood supplied heat, simple vegetable or animal products the light, and sufficient power could be obtained from natural forces, such as wind and water, or by human and animal effort.

With the growth of civilization, the needs of the community have become more and more complex and to meet these needs an improved supply of heat, light and power has been essential.

It was soon found that these primitive sources and forms of energy were inadequate. Coal took the place of wood as a source of heat, gas distilled from coal became the source of light and mechanical power was obtained from steam generated in coal fired boilers.

The discovery of mineral oil opened up new avenues for the production of energy. It was used first as a source of heat, also of power through the medium of steam boilers. It was only tardily realized that the products of crude oil used as a direct power producer in internal combustion engines provided means of transportation which have absolutely revolutionized the domestic and industrial life of the community.

From the time the first oil well was drilled by Col. Drake in 1859 to the present day practically all the oil has come from wells drilled to varying depths, depending upon the location of the oil sands. Obviously, as the fields grow older, the wells become more crowded, the gas pressure goes down, and initial production of the new wells drilled become less and less year by year. An ever increasing drilling program must be carried out to keep up a constant supply. If the demand continues to increase the price trend would be checked by the development of new oil fields.

The world's supplies of petroleum are to-day everywhere attracting the attention and serious consideration of Governments and industries. The continued source of supply and control of that industry, the the vastly increasing demand for liquid fuel and motive motive power of all kinds by land and water, for power and lubrication in world factories, for lighting purposes and for surfacing the enormous road mileage which must be maintained are questions of vital interest throughout the world and Canada points the way to a field of opportunity and effort whose importance to the country as a whole can hardly be exaggerated.

The entire consuming world will also find interest in Canada's latent resources of oil and the manifold by-products.

The prospecting and drilling activities in the vast potential oil fields of Western Canada are of greater importance than almost any other proposed line of development now being promoted in the Dominion.

Competition with the enormous output of the adjacent United States oil fields has done much to discourage production in Canada. Canada's annual oil production up to date stops short of 310.000 barrels (90 per cent from the Ontario fields). There are however oil possibilities in the Athabasca, Peace River of B. C., Calgary, Alba., districts and in New Brunswick and Nova Scotia.

People have feared that before very long the supply would be exhausted. These fears, however, have been proved groundless. There are vast quantities of oil bearing shale rocks, and geologists say that from these shales enough oil will come to supply all the wants for many generations. To obtain the oil, shale is mined like coal and is crushed and heated in retorts, where the oil is driven off.

The foreign fields from which Canada draws crude oil principally are located in Peru (South America), Wyoming, Mid-continent, Texas and Mexico.

Transportation.

The method of transporting the crude, oil (called according to the location. It is the custom, however, to collect all crude produced at the wells in the various fields by means of pipe lines. These lines are divided into two classes as follows:

(a) Gathering lines which collect the crude from the various wells and transport it to a central point, there to be picked up by larger lines known as Trunk lines.

(b) Trunk lines transport the petroleum crude oil from the central gathering point either direct to the refineries or, in the case of some crudes, to a seaport where it is loaded on boats known as tankers and delivered to the refineries, the cost of transporting the the crude depending entirely upon the transportation facilities.

Refining.

On arrival of the crude at the refineries it is placed in large storage tanks and from these tanks it is charged currently to what are known as stills, these stills being constructed of steel and are the shape of a cylinder, being about 14' to 15' in diameter and about 40' in length, under which heat is applied to convert the crude into vapor, as each constituent or component part of the petroleum has a specific boiling point, hence it is possible to separate each part by means of fractional distillation. The vapors leaving the still are condensed by passing them through a series of pipes submerged in water and the petroleum distillates which are to be subjected to further distilling and purification are delivered from the condenser to various tanks. Fuel oil is the residual product remaining in the still after the light fractions are taken off.

Fuel oil.

The B. T. U. Value of fuel oil, or the residual product referred to above, varies to some extent according to the grade. The value of the fuel oil supplied by the imperial Oil Limited to the "Smokestack Trade" (power plants) averages between 18,500 and 19,000 B. T. U.'s per lb.

Various methods are used for handling and transporting the fuel oil from the refinery to users. When large quantities are required and the refineries are situated where water transportation is available the fuel oil is handled from the storage tanks at the refinery to boats by pipe line and delivered by tankers to the consignee's tanks or to tanks from which it can be shipped by short hauls by rail. The fuel oil when purchased in smaller quantities is shipped in tanks cars, or, when smaller than tank car lots are required, it is filled in barrels, although the latter is an expensive way of shipping this particular grade of oil.

Storage.

The question of oil storage is generally looked upon from one of two extreme angles-either as a most hazardous proposition or as so simple a matter as to be worthy of little consideration. To a certain extent both views are reasonable — the former, if accompanied by gross carelessness; the latter, if over-extreme care is used. Fuel oil is not subject to spontaneous combustion nor will it ignite when in bulk form. The danger is due to the tendency it has to vaporize, under high temperatures and form an explosive mixture with the air. As a rule these will not occur unless the flash point is approximated. The oil in a storage tank should be kept as low as possible and still flow properly for pumping.

The size of storage tank required depends on the quantity of oil to be burned and availability of oil supply. The second factor depends in the location of plant, the method of delivery and the probability of interruptions in delivery which must be carefully considered in determining the number of days' oil supply that should be carried at the plant. The storage should be divided into two or more tanks so as to enable shutting down for cleaning without interfering with operation of entire plant.

In built up districts within fire limits tops of tanks must be at least three feet below level of fireroom floor. The tank must be covered with soft earth or sand.

One of the largest reinforced concrete, underground fuel-oil tanks in existence is located at the plant of the St. Maurice Lumber Company, Three Rivers, P. Q. It is divided into four parts and has a capacity of 160,000 barrels. The tank steamers dock at the Company's wharf about 400 ft. distant. From this location the ship's pumps discharge the oil at a temperature of about 90° F. through a 12'' pipe to the storage reservoir. The most important problem in the construction of concrete tanks is to determine properly the concrete mix with the given aggregates that produce an oil-proof, non-porous concrete of high compressive strength unaffected by temperature variations.

To test the oil proofing quality of the concrete, a test box, three feet cube, was poured with 9'' walls; after setting thirty days, it was filled with oil and subjected for five days to a pressure equivalent to a twenty-seven foot head or 50 per cent more than working conditions. The box was broken up and the water-proofing was placed on inside of tank walls.

Many power plants are provided with a service tank located under the fireroom floor, in addition to the main storage tank outside the building. The service tank is filled at intervals from the storage tank, and the oil pumps take their supply from the service tank and distribute it to the oil burners.

Oil to Atomizers.

In practically every fuel-oil installation it will be necessary to use pumps to transmit the oil from service tanks to burners. A certain amount of pressure will be required depending on the class of burners, grade of oil, number of burners to be used and the quantity of oil to be burned. The pressure will also give proper control of oil flow whatever conditions demand. This is done by two duplex piston pumps, one serving as a spare, having strainers in suction and discharge. Between the pumps is a combined receiver and heater for raising the temperature of the oil. In general oil should be heated nearly to its flash point to insure complete atomization.

Atomizers.

Atomizers are devices for reducing oil to vapor and are generally termed burners. The gauge of efficiency, by which they are measured, is the amount of energy expressed in foot pounds used in the device to reduce a given volume of fuel oil to a vapor and at the same time be capable of manipulation, regulation and adjustment to meet plant or operating conditions. Its efficiency will be influenced by that of the furnace and how, when and where air is admitted and united with the oil vapor and the personal equation.

In one type of burner the steam and oil come in contact, the oil is atomized and the mixture issues from the burner tip ready for combustion. The burner requires for its operation about two percent of the steam generated by the boilers and produces a flat flame, with the result that a considerable portion of the volume of the furnace is not made use of.

The mechanical atomizer of the usual design has a decided limitation in range. Unlike the steam atomizer, it cannot be operated at low capacity if it is designed for a high one. The burner depends for its atomizing effect on centrifugal force induced by giving the oil a rapid whirling motion in the central chamber of the tip. Means are provided inside the nozzle to give the oil a whirling motion of sufficient intensity to make it fly into a spray as soon as it leaves the nozzle. The pressure should be at least 25 lbs to produce good atomization and it may be increased up to 200 lbs, anda temperature of 150° F. is required to atomize the oil properly.

The principal advantage is that a large quantity of oil can be burned in a furnace of a given volume on account of the nature of the flame produced, also steam is saved which would be used to atomize in the other type of burner and this is of importance in marine work where it means a loss of fresh water as well as a loss of steam.

Furnaces.

The cooling of the gases by their coming in contact with the boiler tubes before the combustion is pleted with the boiler tubes before the combustion is completed is one of the principal causes of low efficiency in boilers that are forced up to high capacities, and any method of combustion that prevents this occuring tends to improve the efficiency of the boiler.

Complete combustion depends on the extent of mixing the oil vapor with air, time available for such mixing to be complete and temperature in furnace at time of mixing.

Best results are gained by installing the burner so that the direction of the flame is toward an increasing volume of furnace. This will allow free expansion and complete mixing of the oil vapor with the air. To accomplish this in certain types of boilers it might be necessary to install the burners at the rear of the furnace and the checker work under the burners that control the admission of air must be properly designed.

In order to operate oil burning boilers at high capacity it is necessary to provide ample furnace volume.

It is possible with steam atomizing burners to burn as high as 6 to 7 pounds of oil per hour per cu. ft. of furnace space. Three or four pounds gives best efficiency and 60 to 70 cu. ft. per burner will generally give good combustion.

Hazards.

Most accidents in oil burning plants are caused by flarebacks, these usually occur when lighting up and and can be prevented by frequent inspection of burners and feed piping for leakage. It is good practice to blow steam or air through furnace to drive out the oil vapor before lighting the burners. Occasionally a flame may be extinguished through some accident, at such time valves should be closed immediately before oil has a chance to accumulate and cause back flare.

Advantages.

A few of the advantages in the use of oil as fuel:—

(1) General cleanliness.

(2) High boiler and furnace efficiency.

(3) Ability to carry overloads and meet, almost instantly, wide ranges in load.

(4) Total absence of smoke, small dust and ashes.

(5) Uniform draft and air supply, giving minimum variation in furnace temperature.

(6) No loss when stored indefinitely. Freedom from loss due to moisture and absolutely uniform quality, every pound of oil containing the same number of heat units, which can all be converted into heat without waste.

(7) Storage in any convenient place.

(8) Low cost of handling. The labor required in the operation of an oil fired plant would average two-thirds less than that required in a coal fired plant.

(9) Saving in floor space.

(10) Economy of construction.

Disadvantages.

(1) Difficulty of obtaining oil supplies.

(2) Cost.

(3) Danger from inflammable vapor caused by oil leakage.

(4) Risk of oil leaking into steam side of heater and finally entering boilers.

In discussing the advantages of oil as fuel the question naturally arises as to how it will compare with coal on a cost basis. For purposes of comparison, data were obtained from two plants having similar installations and operating under like conditions of load and climate. These data were taken from actual running conditions at the mills and consequently should form a reliable basis on which to compare the two classes of fuel.

The coal fired plant from which the data were obtained is equipped with eight Babcock & Wilcox water tube boilers installed in batteries of two. Each boiler is rated at 500 H.P. They are equipped with automatic stokers of the moving chain grate type which permits a very close regulation of the fires. They are also equipped with automatic feed water regulators, superheated coils and economizers. The amount of coal used is accurately weighed and the coal is tested at regular intervals for its basic properties. The flow of steam is measured with "Bailey" meters and accurate records kept.

The oil fired plant also has Babcock & Wilcox boilers, the same size and number, and installed in a similar manner to the coal fired plant. They are provided with efficient oil burning equipment and consequently have a much larger combustion chamber than is used in a coal burning boiler. They also have automatic feed water regulators and superheater tubes but on account of the low temperature of the flue gases produced in an oil burning plant, have no economizers.

The quantity of oil pumped to the boilers is measured by a registering meter and the total steam generated is accurately measured with recording meters. Meters are used on each boiler to record the temperature of the flue gases, the amount of CO_2 in the flue gases, the amount of draught and the steam flow from each boiler.

The following tables have been compiled from the results obtained in the plants described.

COAL FIRED PLANT.

Basic Properties of Coal.

Moisture	8.21%
Ash	12.28%
Fixed carbon	49.98%
B. T. U.	12,753

Plant Conditions.

Steam pressure	150#
Degrees of superheat	150°F
Feed water entering economizer	174°F
Feed water entering boiler	235°F
Flue gases entering economizer	526°F
Flue gases leaving economizer	108.7%

Operation.

Equivalent evaporation	8.92#
Average hourly production	100,000#
Over-all efficiency	73.8#
Steam used in boiler house	6.23%
Cost per 1000# steam generated:	
(a) Coal	$.601
(b) Labor	.063
(c) Repairs	.030
Total	$0.694
Cost of steam per 1000# delivered from boiler house	$0.737

OIL FIRED PLANT.

Basic Properties of Oil at 60° F.

Moisture	Trace
Sediment	Trace
Specific gravity at 60° F.	.958
Flash point	239°F
B. T. U.	18,170

Plant Conditions.

Steam pressure	110#
Degrees of superheat	100°F
Feed water entering boiler	176°F
Temp. flue gas	450°F
Temp. oil at burner	150°F
Draught	.11"
Average rating	108.7%

Operation.

Equivalent evaporation	14.94#
Average hourly production	41,000#
Over-all efficiency	79.8%
Steam used in boiler house	12.98%
Cost per 1000# steam generated:	
(a) Oil	$.419
(b) Labor	.033
(c) Repairs	.006
Total	$0.458
Cost of steam per 1000# delivered from boiler house	$0.517

The above figures are based on coal at $10.50 per ton in hopper over boilers and oil at $2.30 per barrel delivered in storage tanks.

To illustrate the relative fuel values of oil and coal the following concrete example is worked out using the data of the foregoing table.

Coal.—12,753 B.T.U. Moisture, 8.21 per cent. Efficiency, 73.8 per cent. One ton of coal as delivered contains 2000 × 91.79 = 1835.8 lbs. dry coal which contains 1835.8 × 12.753 = 23,411,957 B.T.U. The plant being 73.8 per cent efficient, then 23,411,957 × 73.8 = 17,178,024 B.T.U. are turned into useful work.

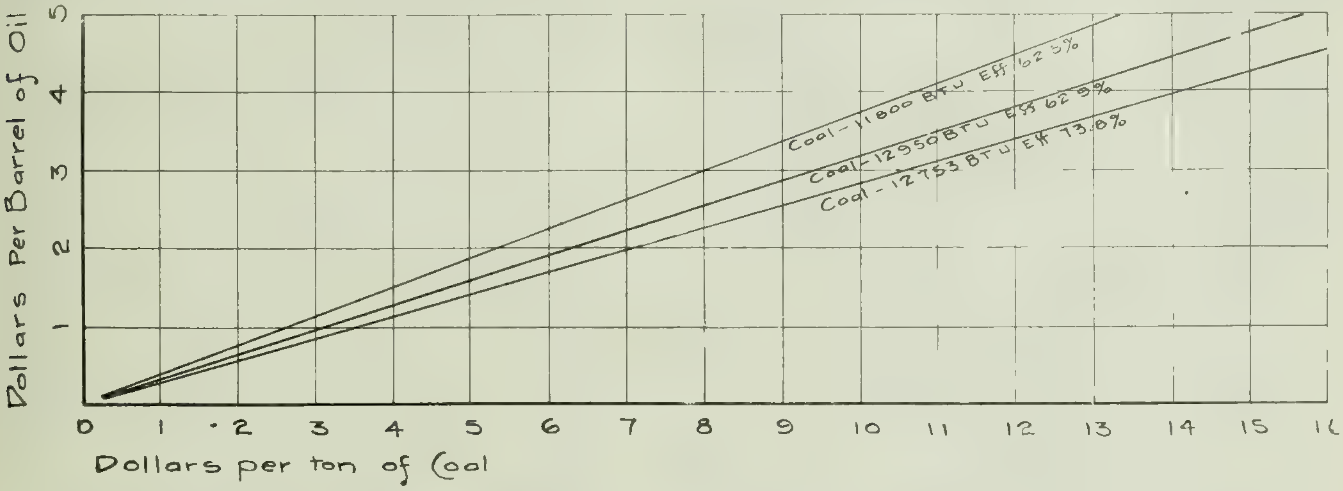
Oil—18,170 B.T.U., moisture nil, efficiency 79.8%. One barrel of oil contains 34 Imperial Gallons or 336#, or one barrel of oil contains 336 × 18,170 = 6,105,120 B.T.U. The plant is 79.8% efficient. 6,105,120 × 79.8 = 4,871,885 B.T.U. are turned into useful work.

Continuing these figures and applying the cost of each fuel, the following graph has been plotted from which a close approximate ratio between the cost of coal and oil can be determined. In this graph it is assumed that all oil-burning boilers will give an efficiency of 79.8%.

Where it is necessary to operate the plant at no load and be ready to pick up the load at any instant, the boilers must be kept hot even though no steam is generated. With coal fires this is accomplished by keeping a banked fire on the grates. With oil the fire is put out completely, and when the steam pressure in the boiler has dropped as low as permissible. the fire is relighted and the steam brought back to full pressure. During the time the fire is out the damper may be shut tight, thus materially reducing the loss of heat. In a boiler with good tight dampers the drop in steam pressure will be not more than 10# to 15# per hour.

Approximately fifty textile mills, with over 400 boilers, were converted from coal to fuel oil during 1920, making a total of 145 textile mills in New England and New Jersey, with 850 boilers and 175,000 rated H.P. that are using fuel oil.

Deliveries of fuel oil to merchant vessels in 1920 at Atlantic Coast points totaled 19,326,410 barrels, representing largely Mexican oil. Theoretically the proposed tariff of $1.50 per barrel levied against Mexican oil in U. S. would cause the use of domestic oil and stop the importation of the Mexican product. Continued trouble in England with labor and coal production has resulted in systematic attempts largely to substitute oil for coal in British industrial plants. The situation is gaphically explained in the statement that the average annual coal output per miner in Great Britain is 193 tons, whereas in the U. S. the annual output per miner is 889 tons. British industry cannot successfully compete with this terrific labor handicap. Labor conditions in the oil industry have always been stable and dependable. With an embargo against the use of Mexican oil in the U. S., Great Britain can profit immensely by the near monopoly of Mexican oil they would enjoy.



THE 1 PER CENT CLAUSE IN MOISTURE TESTING.

To the Committee on Moisture Testing.

There is some question as to the meaning of agreement "within 1 per cent" in cases of joint test.

1. Is it within 1 per cent of the billed test?
2. Is it within 1 per cent of the net weight as billed?

If a car of pulp were billed at 80 per cent and the joint test at receiver's mill gave 79 per cent the position of question 1, would exist. This would mean that in spite of shrinkage in transit, the pulp is found 1 per cent wetter at receiving mill. As this shrinkage in some cases would amount to two percent or more, a pulp tested correctly at shipping point as 80 per cent should then give 82 per cent or more at receiving mill.

A finding of 79 per cent on the joint test would mean a difference of three per cent on the net weight.

It is the opinion of the writer that the agreement should be referred to net weight and not to figure of air dry percentage.

T. L. CROSSLEY.

PATULLO SEEKS AID FOR PAPER MILL

Victoria, January 16. — Hon. T. D. Patullo, minister of lands for British Columbia, will go East next month to interview financial interests in Eastern Canada in connection with the proposed pulp and paper mill at Prince George. At the same time he will take up departmental business at Ottawa, after which he may go to Europe to further the immigration proposals by which he hopes to bring to this province several thousand British families for settlement on British Columbia lands.

While in Europe Mr. Patullo will continue the work he started last year of finding new markets for British Columbia lumber.

Ontario farmers want the Government to pay freight on pulpwood the market will not absorb. What's the idea? Where do they want it taken? If they can't sell it, they better keep their eyes on it.

A man should not be judged by the result of his labor, but by the nature of his effort.—Selected.

UNPARALLELED DEPRESSION IN BRITISH PAPER MILLS LAST YEAR.

(Special from our London Correspondent.)

"We are not making money, but we have full employment, and the tide will turn before very long. I think I see enough blue sky on our horizon to make a Dutchman a pair of trousers"—so declared Mr. F. E. Becker at the eighteenth ordinary general meeting of Charles Marsden & Sons, Ltd., of which company he is chairman.

Canadians have only to look up their paper mill directory and see the names of the miuls with which the Marsden firm is concerned in England and Ireland. For the year ended September 30, 1921, the following dividends have been paid out of the net profits of the company: (a) upon the preference shares a dividend at the rate of 7½ p.c., p.a., less tax; (b) upon the ordinary shares 5 p.c., p.a., less tax. The directors it appears hesitated long as to paying the modest dividend, but as the sum carried forward was 47 p.c. of the capital, and all taxes had been taken into account, they ventured as far as a 5 p.c. as it took only £10,500 net from the balance. The profit made by Marsden's was only £2,302.16s. for the year—which is not bad considering everything.

Mr. Becker, in his annual speech, retrospective and enlightening on the vicissitudes of mills in 1921, said they had passed through a year of unparalleled depression. Export almost entirely stopped; prices of raw material collapsed when the stores were full; paper was all but unsaleable, and early in the year Marsden's had to close their mill at Lintzford, for the paper which was made there — greaseproof — was shipped from Germany at far below the price of the raw material from which it was made. It was a sad decision to come to; not only was a valuable plant laid idle, but the men and women have been out of employment for 41 weeks at Lintzford and the Company was at heavy charge to maintain the mills. "Turning to the accounts", continued Mr. Becker, "you will observe that we have written off depreciation only on mills not under active reconstruction. Dearne, only just completed after a very heavy capital expenditure, has now five machines, four of them new ones. Tamworth will be completed during this year. Our creditors are large, the revenue being one of the great ones. The contingent liabilities are printed...Irish debentures are a falling item; Northfleet is reduced to £60,000; Rainsbottom is never likely to be called; the bills are negligible.

The Outlook—and Dumping.

Commenting on the future prospects of the company, Mr. Becker said: "Last year our capacity was 32,500 tons and we sold only 17,636 tons. This year our capacity is over 35,000 tons, and, when Tamworth gets her new machines, it will be at the rate of over 40,000 tons. I am thankful to say that all the mills, except Lintzford, which is still shut, are fully occupied. We are engaged up to utmost capacity at Dearne. We have no great matter to consider as to bad forward contracts; we are practically clear. How long this will last remains to be seen. We are still the dumping ground of countries with collapsed exchanges. Germany quotes newsprint below the cost of manufacture here by £6 or£7 a ton, but happily she does not always deliver. The price varies with the exchange. Finland is, it seems, getting her best market — the Russian — going and I hear that many thousand tons of newsprint have been recently sold there. If we can hold out long enough for the slow and stately operation of the Safeguarding of Industries Act to have effect, we shall have this difficulty removed from our path. Export is reviving. Through our Mr. Holland's urgency, the Australian Government have given us a £3 preference on newsprint over all comers. This has revived the newsprint trade, has caused practically all the newsprint machines to run, and has given a healthy tone. It is an act of real relief for which this trade should be heartily thankful. Our representatives are out all over the world and we have very great hope that profitable business may result. I have no remedies to suggest. but we are, I am sure, all thankful that our men are employed fully during these dreadful times. If they would work 48 hours a week instead of only 44 hours they would greatly help us.

"As to our subsidiaries, Northfleet will have been completely reconstructed as to steam plant and machines by early spring. We have a very fine plant there, but we shall get no dividend from it for some time, as the mill must recover. Our 'Dark Roselin' in Ireland shows every prospect under the peace, which God grant may come, of being the jewel of the lot. Ramsbottom, under Mr. Seddon will keep its end up.

"Ha! Ha! Bay is making the best pulp that comes in the mill. Watsons, of Bullionfield, will probably help us next year. I as kyou to look on the future not without anxiety but without dismay. I feel we have weathered the storm, not without credit."

Amongst the directors of Marsden & Sons are Mr. Stanley Cousins and Mr. Fred. Moseley. It will be noticed in Mr. Becker's short speech that at the various mills improvements are being made to enable them to cope with modern trade and that the Papermakers of the United Kingdom are evidently waiting for a hearing under the Safeguarding of Industries Act 1921 to try and get the 33 1-3 p.c. duty imposed on imports of paper from Germany and Finland into England.

Mills Changing Hands.

Some Scottish mills towards the end of 1921 changed hands. Indeed there is a tendency to form combines and syndicates in the United Kingdom to meet the changed conditions since the European war broke out in 1914.

Mills have also in many cases been brought up-to-date, or improved in some way to reduce cost of production which has to be cut down to a viceity in these days of competition. The subsidiary company of A. Pirie & Co., known as Pirie's Photographic Paper Co., has started the new mill in Scotland. It is a new mill produced by a very old firm and is a step in the right direction.

Pulp Men Alarmed.

As mentioned in my notes last week the British Wood Pulp Association have discussed the serious position in which the paper industry is placed. They say it is alarming and the gloomiest of the agents predicts another twelve months depression. Mr. Becker, however, sees a ray of sunshine. But the pulp men generally see red just now and the strange thing about the whole position is that they say there is nothing to be made out of either pulp or paper — even those selling German and Finnish pulps and paper admit it.

It is now openly admitted that the forestry conditions in Sweden are in a very bad state at present. Pulp men say they cannot deliver "the goods" any cheaper than they are doing at present. They are down to rock bottom quotations. On the other hand paper mills say: "We have no customers; we want no pulp." And so the repartee goes on. But the paper mills have been warned at the annual meeting of the Pulp Association that they need not look to the wood pulp trade for any further assistance in prices.

PULP AND PAPER NEWS

It is common knowledge that the data concerning our forest resources is lamentably deficient. We are aware in a general way of the amount of timber available, but exact information is lacking. The Quebec Government, always to the book in forestry legislation, will introduce a Bill having for its objects the taking of an inventory of the Province's forest resources, affording better protection for the forests, and promoting reforestation. This will enable as to know how the Province stands in the matter of pulpwood resources.

The following are the officers of the St. Maurice Sales Company, Ltd., Montreal, formed to undertake the export trade of the St. Maurice Paper Company, Limited. President, Mr. Alex. Calder, New York; vice-president, Mr. H. W. Cressy, Montreal; treasurer, Mr. G. S. Rorke, Montreal; secretary, Mr. T. M. Day, New York; assistant secretary, Mr. H. F. Smith, Montreal.

Mr. A. D. Huff, of the Riordon Company, and Mr. W. Gorman, Provincial Mills, Ltd., were present at the opening dinner of the Export Club of Montreal.

The University of Toronto has made arrangements for lectures on various phases of industrial technology. In this series, Mr. T. L. Crossley is to deliver a short course of lectures on Pulp and Paper covering the salient features of preparations and productions. In a similar series at McGill University, Mr. J. N. Stephenson is to give four lectures, illustrated by lantern slides, on the manufacture of Pulp and Paper. The students will be shown the experimental plant at the Forest Products Laboratories of Canada. Both lecturers are members of the Committee on Education for the Technical Section of the Canadian Pulp and Paper Association.

DRURY'S EARNEST ATTITUDE TOWARD FORESTRY.

The annual meeting of the Canadian Forestry Association was held on January 11th. It was largely attended and much interest was evinced. Meetings were held in the King Edward Hotel Ball-room. The principal speaker was the Hon. E. C. Drury, Prime Minister of Ontario, who spoke quite frankly as to his Government's attitude towards Forestry, among other things he said, "My Government has not been free from blame and criticism". He said, however, that it was not prepared to revolutionize the Forestry policy until the present Commission should make its report, that in the meantime the impatient ones should pray for more patience.

The general policy of the Ontario Government will be to assume that the forests are a crop and they will treat them that point of view. One of the interesting notes of this address as that increased efficiency in protection was evidenced by the fact that there was no very serious fire last season.

Mr. Edward Beck gave a very interesting address as a Canadian observer in Scandinavia, one of the points that he strongly emphasized was the wide spread knowledge through the schools and industries of the value of the forest. This is instilled in childhood and kept in mind at all times, a familiar saying being that the future of Sweden lies in here forests, yet it is only about thirty years since efforts were awakened in this direction

In the course of his address as guest of honor at the Dinner which concluded this meeting, the Hon. Beniah Bowman, Minister of Lands, Forests and Mines, said that it had been decided to ask the lumber interests to nominate a committee to assist the government in its forestry policy.

UNITED STATES NOTES.

The International Paper Company has filled a statement with the New York Stock Exchange covering operations for the eleven months ended November 30. The preliminary report shows a net loss of $6,754,310 after providing for interest and depreciation and a $6, 000, 000 reserve for 1921 inventory depreciation. Deducting preferred dividends for the year, the deficit approximates $8,000,000. Profit and loss surplus as of Nov. 30 is given as $24,183,309.

Discussing the forestry problem before the House Committee on Agriculture last week, Former Chief Forester Gifford Pinchot predicted a timber famine in the United States within twenty-five years. "Only about 1,250,000,000 acres of virgin timber remain out of 8,250,000,000 acres the country once had," said Mr. Pinchot. "Two-fifths of the timber land is in the hands of 250 owners, who hold it only to destroy it." Mr. Pinchot appealed for a policy of strict Federal regulation, and supported the Capper bill as against the Snell bill, which he attacked as limiting control to the States.

Frank P. Lydon, who, as manager of the Franklin, N. H. mills of the International Paper Company, kept that plant running through the protracted strike period, has been promoted to the place of assistant to the company's manager, Mr. Allan Curtis. Mr. Lyden will have offices at headquarters in New York. He succeeds F. E. Holbrook, who has resigned to manage a large paper mill in Wisconsin.

A lack of water-power is again interfering with opertions of manufacturing and paper-making plants along the Black River Valley in Northern New York. It is expected that the troubles will be of only short duration, since water contained in reservoirs may be sufficient to yield the flowage needed for relief. Orders for the release of more water through the opening of reservoir gates have gone out from the Black River Regulating District board.

Damage done last year to the stand of fir and spruce in Maine by the spruce bud-worm, is put by James W. Sewall, Forest Engineer, Old Town, Maine, at 27 per cent. in the case of spruce, and 73 per cent total loss in the case of fir. This is a reduction of one-third in Maine's stand of available pulpwood. The death damages run from as light as 5 per cent of the spruce and 10 per cent of the fir killed off in some localities, to 75 per cent of the spruce and 100 per cent of the fir totally gone in others. The Forest Commissioner rates the loss thus sustained by the State at approximately $86,500,000, or $115 per capita to the inhabitants of the State.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, January 17. — While conditions in the pulp and newsprint sections are not exactly lively, other departments are experiencing a fair amount of trade. Paper jobbers, who by the way, are not over-burdened with stock, say that orders are coming in satisfactorily, but that they are of the hand to mouth description. Business in fine and book papers, according to manufacturers, is looking up, and there is no reason to anticipate a let up in this direction. The contracts for newsprint so low will not cover the entire capacity of the mills, and there is also an uncertain element as to future prices. They are now down to a point at which they will not been further cutting without injury to the industry, but keener competition may yet ensue. The demand for pulp is slow, and will not probably show any life for at least another month.

The keen competition in the paper trade of Australia and New Zealand, will be gathered from the following figures: English s.c. printings are being quoted at 4d. f.o.b. British port, was including export packing. There is no duty. English cream laid paper is quoted at 4d. f.o.b., including the duty of 5 per cent ad valorem. This price are below the cost of manufacturing in Canada. Advices received from Australasia state that the paper business is still in a very depressed state. Stocks of all classes are very heavy and very low indent orders are being placed, while those orders that are placed are very small indeed. English and Scandinavian prices for all goods are very low.

The market situation in the neighborhood of Toronto and throughout the Niagara Peninsula has no features of outstanding interest. The mills are working generally on a little better basis than in the Fall, with the exception, perhaps, of Coated papers, which are not moving so actively at the present. Reports from all quarters show a condition of quiet optimism, in fact that phrase is becoming more or less a platitude in Bank and Insurance reports, cropping up in presidents' and managers' addresses. The whole view seems to be that industry is gradually working toward improved conditions.

The following covers some of the present market conditions:

PULP and NEWSPRINT show little signs of change. There is perhaps an improved movement in bleached sulphite.

BOOK and MAGAZINE markets are only taking actual requirements.

COATED PAPER market is without features.

BRISTOLS and COVERS have had no price changes and enjoy a fair demand.

PAPER STOCK—Increased firmness in the lower grades is the outstanding feature of the waste paper market during the last few days. There is a better demand for news and mixed papers, and both these grades along with the container manilla and print manillas sold at slightly higher prices.. The market on better grades is firm and some sales at slighty higher prices have been recorded. There is, no doubt, a scarcity of old papers in the market at present, and any strong buying movement on the part of the mills will soon force prices to higher levels.

TAGS—There has been a slight reduction in price which has shown a reflection of slowing up in buying. The prospect are for an advance on this line in the very near future.

NOTES ON OTHER GRADES—There is a fair demand for all grades but not a great deal of life to the buying.

COTTON RAG—Apparently the long waited improvement in the roofing rag market has set in. Several of the mills have come into the market for fair size tonnage and dealers are having difficulty in locating enough stock to fill orders. New cotton cuttings have developed no new features, and the market is in a distinctly dull condition. The prices quoted are strictly nominal, as sales are too few to establish a firm market price. There is practically no improvement in scrap bagging market. Dealers stocks being fairly large with very little chance of improvement unless the roofing rag market becomes clear of stock..

Manilla rope and strings are moving in small quantities only, and the prices quoted are strictly nominal.

NEW YORK MARKETS.

New York, Jan. 14.—(Special Correspondent)—Trade activity in paper seems to be developing at a fairly good rate. Jobbers in New York generally report consumers are taking slightly larger amounts of paper than over the holiday period, and while the market has not opened up in full fashion as yet, there is sufficient business to give matters a comparatively lively tone. What is even more encouraging is that all indications point to a continued healthy growth in demand for paper of various kinds, and that the market situation is steadily working into a more stable position.

Consumption of newsprint in New York this week has been heavy owing to the large issues printed by local newspapers to carry extra advertising apropos of the national automobile show in this city. Morning papers have in some cases printed as many as 48 pages in a single issue, while afternoon dailies have been running between 30 and 40 pages all week. The newsprint market rules steady with no fresh feature in respect to prices. Publishers are taking contract tonnage in a regular way, and are buying off and on in the open market. Spot prices range from 3.50 to 4 cents per pound for roll news, with 3.75 cents the most commonly named quotation.

There has been a slight stiffening of prices on tissue papers. Whereas some mills were selling No. 1 white tissue, 20 x 30, at 80 cents a ream, the quotation now prevailing is 90 cents, and prices on lower grade tissue have been advanced in like proportion. Kraft wrapping papers continue in steady demand and prices are holding at around a basis of 7.50 cents per pound for No. 1 domestic kraft. Book papers are rather easy in price though no further sharp recession is reported. Box boards are quoted with much more firmness by eastern mills, who ask $40 per ton New York for plain chip and $42.50 for news board, though some are accepting orders at about $2.50 a ton under these figures.

GROUND WOOD.—Mechanical wood pulp is moving into consuming channels in fair tonnage, although

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chiefly on contract, and quotations rule steady, domestic producers asking in the vicinity of $33 to $34, on an average, for prime spruce ground wood, and importers quoting from $33 to $35 ex-dock New York. Indications are that current consumption of ground wood is on a par, if not in excess, of production, which makes for a firm market undertone.

CHEMICAL PULP.—Developments of importance in chemical wood pulp are lacking. Paper mills are buying simply to cover immediate requirements which causes demand to be spasmodic and lacking in volume. Nevertheless quotations are well maintained and there is little or no selling pressure in evidence. Reports have been received of news grade sulphite of domestic manufacture selling at close to 2.75 cents per pound at pulp mills, attesting to a firm market for this grade of pulp. Bleached sulphite is under good inquiry and firmly quoted, leading domestic producers asking 5 to 5.25 cents a pound for No. 1 bleached at pulp plants.

CANADIAN PAPER MAKES FAST TRIP

Philadelphia journals have not been getting any paper from Canada for several years, and a trial shipment of 600 tons was recently ordered by the Canadian Export Paper Company from Price Brothers and Company's mill.

The 24 cars left Kenogami by a special Canadian National train Saturday midnight, 14th instant, and arrived at Philadelphia midnight on the 17th, making the run of 944 miles exactly in three days.

The 329 miles from Kenogami to Hawkesbury over the Canadian National Railways was made in twenty-two hours, including stops. The 90 miles over the Grand Trunk to Rouses Point took five hours, and there was a delay of five hours at the border. The actual running time for the 372 miles on the Deleware and Hudson Co., from Rouses Point to Wilkesbarre consumed twenty-four hours: the 84 miles over the Central Railroad of New Jersey from Wilkesbarre to Allentown took four hours: and the last 68 1-2 miles into Philadelphia could have been made in four hours, but took nearly ten.

It is interesting to note that this shipment will bring forty-two thousand U.S. dollars into Canada, as well as contribute some $5,600 in freight charges to the railways.

A stubborn fire which brought out all of the fire fighting apparatus from neighboring towns, caused the destruction last week of the Angier paper mills at Ashland, Mass. The plant was used for waterproofing paper. It is believed the blaze was caused through the firing of a coating machine from a motor spark.

EUROPEAN PRICES AFFECT SPOT MARKET

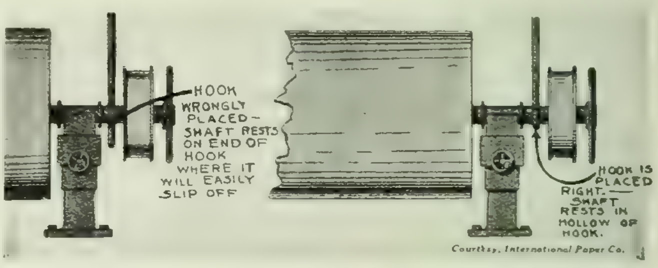
The following despatch was received on Saturday from Dow Jones, Boston:

German and Scandinavian news-print is selling in American markets at about $10 per ton under prevailling domestic price of $70 per ton. But a large quantity has been offered as low as $50 per ton on the dock at New York and other Atlantic ports. Although relatively small in amount, European shipments are sufficient to break the spot market and often affect the whole price situation.

European competition began in September, 1920, with imports of 676 tons of German print, growing to 14,208 tons from the same source in December.

Highest paid labor in German paper mills receives eleven cents per hour, acording to last available figures, while freight from Hamburg to New York is but $3.64 per ton. This compares with rate from International Paper Co.'s big mills at Bellows' Falls Vermont, of $3.80 to New York. Wages in German mills are likely to be stabilized at a level which will give skilled labor a pay cheque of $7.75 per week compared to present American scales of $47.24 to $23.04 per week.

In addition to all this the German Government, until recently, subsidized the industry, granting 500 marks a ton in cash.


HOOK WRONGLY PLACED — SHAFT RESTS ON END OF HOOK WHERE IT WILL EASILY SLIP OFF
HOOK IS PLACED RIGHT. — SHAFT RESTS IN HOLLOW OF HOOK.

Courtesy, International Paper Co.

Operated safely! See that the hook is placed properly!

ABITIBI'S PRODUCTION

Iroquois, Falls, January 14. — All the machines at the plant of the Abitibi Power and Paper Company are now in operation according to official advice. Moreover, it is understood that the prospects are that the Abitibi is pretty well assured of a full demand for continued full capacity operations. In the equipment now in use is one newsprint machine which is the largest in the world and which is stated to be giving excellent service.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. **GARDENVALE, P. Q., January ~~19,~~ 26 1922.** **No. 3**

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More Startling Forest Facts

By Frank J. D. Barnjum, Annapolis Royal, N.S.

It has been recently brought to my attention that some foreign buyers of Canadian wood, who are trying to camouflage their own operations, are making the statement that my efforts to conserve Canadian wood for Canadian industries is not an unselfish campaign, as an embargo on wood being shipped out of the country would materially increase the value of lands which they claim I own in the United States.

I do not own an acre of land in the United States or a dollar's worth of property of any nature in that country. Even my own relatives who have small land holdings in Maine have sold a large part of the stumpage on the same, leaving them with but a small supply of wood for their own mill, so that they are in the same boat with other pulp and paper manufacturers in the United States.

If I had any selfish motives I would not be advocating an embargo on fee land wood, as my holdings are all fee land in Nova Scotia, and if it is worth more to the settler and farmer to be free to ship his wood to the United States, the same argument would apply to my holdings as well.

I have become so thoroughly imbued with the critical situation that is facing this continent with regard to its wood and timber supply that I am withdrawing from business as rapidly as possible so as to be in a position to devote my whole time to what I consider is the most important problem facing Canada, namely, the conservation of her wood supply.

It has been frequently stated that the bud worm has passed over New Brunswick and departed, but from a recent cruise on quite large an area in that province it was discovered that thirty-five per cent of the soft wood trees were defoliated by this pest the past summer.

An owner of some 250,000 acres of land in Maine advised me last week that after a careful cruise of his lands the investigators found the fir was all dead, and from 48 to 52 per cent of the spruce as well.

I have seen another recent report on a large area in Northern Maine which shows 64 per cent spruce and fir dead.

The whole situation looks very serious to me. It would seem as if man and insect were fighting for control of the earth as, without trees, human life could not exist.

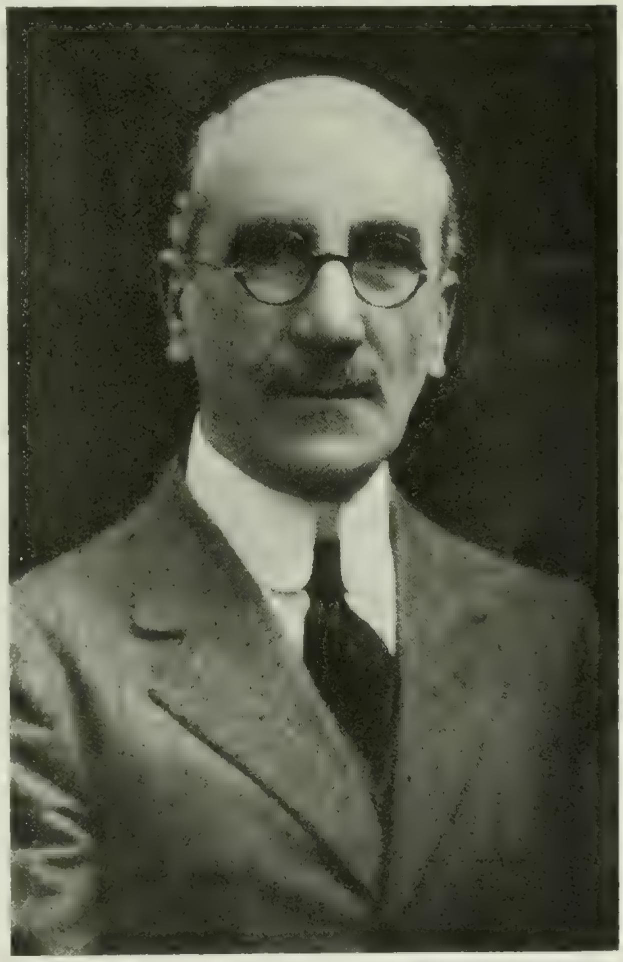
Logging Slash Threatens Destruction of Forests.

The time is approaching when we shall be forced for the very preservation of our lives, to burn all logging slash and debris left in the woods. This slash has been very aptly termed by Dr. J.M. Swaine "the garbage of the forest." It is just as much a menace to our tree growth as a breeding place for insect life which threatens the destruction of our forests as the garbage of a city is to human life, with the added danger from the enormously increased fire risk. If all land owners are required to burn their slash it will be no hardship as everyone will be on the same basis and the cost will simply be passed along or added to the sale price of the product, whether it be pulp wood or lumber. As this is one of the most effective measures in prolonging the life of our forests, no one should object to its adoption.

The Canadian pulp and paper companies should—

(1) Reduce the cut on their own lands as near one-half as possible;

(2) Insist on an embargo or an export tax of not less than $10.00 per cord on fee land wood, so as to save for the mills of Canada the large amount of wood that is now being shipped out of the country, and with the immense amount of capital invested in Canada in the pulp and paper industry this is imperative;



Mr. Barnjum.

(3) Insist on more and better fire protection;

(4) Insist on the burning of all slash;

(5) Insist on the utilization of every inch of the tree that is cut down;

(6) Improve present wasteful logging methods; and

(7) Insist on reforestation on a large scale.

The most serious question to consider in this connection is what we are to do for a wood supply for our mills between the time of the exhaustion of our present stand, some fifteen years hence, and the time when the seedlings we are about to plant grow to the minimum size for pulpwood, some forty years hence.

Enormous Increase in Consumption and Waste Overlooked.

Very few writers figure on the enormous increase in consumption of all kinds of wood that is going on on this continent through increase in population. This increased consumption, together with the enormous destruction caused through fire, bugs, wind, and waste in every logging operation, is usually overlooked in computing the duration of our present wood supply. They simply take the estimated stand, which is always very wide of the facts, and then compare this with the annual cut, which is always much larger than is reported, leaving out of consideration entirely the very much larger elements, namely, increase in consumption and the tremendous loss through waste. Even the annual shipments of Christmas trees from the State of Maine increased in twelve years from 500 to 1,750,000 trees. I merely cite this as an example of the enormous increase in consumption in only one small branch of the wood-using industries.

In this connection I should like to call attention to Bulletin No. 835, entitled "Wood for the Nation," written by Colonel W. B. Greeley, Chief Forester of the United States, and published by the U.S. Department of Agriculture, which is one of the best written and most comprehensive articles that has come to my notice. This Bulletin should be read by every one who takes any interest in forestry.

There should be no further expansion of the pulp and paper industry in the East from the standpoint that there is not the raw material to feed them. Any new mills that are built in the East will simply be taking the raw material away from the mills which are already operating and which have very large capital investments and upon which whole towns and cities are depending for their existence.

This year we shall, of course, see the same high prices, proportionately, for wood that obtained a year ago, and personally I have always felt that high prices for pulp wood and paper are the only salvation of the situation, as high prices are the only thing that will reduce waste and prolong the life of our wood supply and the life of the pulp and paper mills.

High Prices the Most Practical Conservation Measure.

Just so long as low prices for wood and paper continue this enormous waste will go on. High prices are the most practical conservation measure we can have. The higher the value the greater the conservtion; so in my efforts to arouse the public to our critical condition with regard to our wood supply I am simply working not only in the best interest of the pulp and paper mills but for the good of the whole continent as well.

The price for pulp wood for the future will have to be much higher than in the past in order to compensate the land owner for the cost of slash burning, increased fire protection, reforestation, continual increase in length of haul and increasing scarcity in the supply.

The one consolation the timberland owner has with regard to the loss he has suffered through the ravages of the bud worm is the fact that what he has left will be worth four times as much per cord or thousand on account of the great reduction in the remaining supply. This is, of course, only from the mercenary standpoint, and the sad question remains as to what our children are to do for wood, as we are even now using up their heritage. Every time we cut one of these small, half grown trees, of which our operations are largely made up to-day, we are simply robbing our own children. In fact, it is worse than robbery as it is a menace to their lives.

I have heard the remark made that we are still cutting, in spite of the prediction made thirty years ago that timber would be exhausted in the east by the present time.

My answer to this is that the prediction made at that time has proved absolutely correct as what was called timber in those days is gone forever. I sold my first stumpage at that time and the operator would only cut a mark of logs that would run four to the thousand or two hundred and fifty board feet per tree, while we are cutting mere poles to-day running down as small as forty trees to the thousand board feet and which at that time would have been consided worthless. So we must not derive any comfort from the fact that we are still cutting trees, but rather the reverse, when we look at the size of the poles in our river drives and the amount of three and four inch pulp wood seen at our railway sidings.

There seems to be so much ignorance with regard to our timber resources that I shall here merely state a few well known and acknowledged facts, and then every one, whether he be an expert or a layman, can figure out whether we need any further information before we come to a realization of the alarming condition that is facing us with regard to the future of our wood supply.

In the first place, the word **timber** is a misnomer as applied to our wood growth east of the Rockies to-day; for our timber is practically a thing of the past, and we are down now largely to a pulp wood proposition.

Take the State of Maine, for instance. A few years ago this was called the Pine Tree State, while to-day the pine is gone. It next became the great spruce lumber producer. To-day the saw mills of the mighty Penobscot and Kennebec Rivers are little more than a memory; while here in Nova Scotia it is very difficult to fill an order for lumber calling for even 5 per cent of 12 inch stock.

In addition to the loss from cutting, fire and wind, very few are yet fully aware of the tremendous loss we have suffered the past three or four years through the spruce bud worm and its resultant pests or followers. It is perfectly safe to state that Maine has lost through dead and still dying timber 50 per cent of her spruce and fir stand. The same figure will apply to New Brunswick. The loss in Quebec has been set by competent authorities at 75,000,000 cords. Nova Scotia has practically escaped this pest. Owing to the small amount of fir or balsam in this province, it has been unable to gain a foothold here. This scourge, having swept over the eastern country, is now working west through Ontario, as well as along the north shore of the St. Lawrence and in the Lake St. John district and is doing a vast amount of damage in these sections.

Some writers have advocated that we should take a census of our timber supplies, but we already know, without any further information, for all prac-

(Continued on page 71.)

Transactions[*] of the Technical Section 1922

The Utilization of Jack Pine in the Manufacture of News Print

The Belgian Industrial Co., Ltd.
BY MAURICE NEILSON

The subject of this paper is, I think familiar to, if not popular with most mill men.

In saying that it is not a popular subject, I mean that to the operating man, the word Jack Pine is often something in the nature of a bugbear which ought to be kept very much outside the mill-gates.

When the production drops below the mark, and the manager wants to know the reason why, the operating man is apt to reply, "What can you do, with all this Jack Pine coming into the Mill"! Or he may even in desperation make a dash for the log-pile to find out what deviltry the wood-room superintendent now is up to.

However, to the manager the possible use of Jack Pine in the mill presents a point of view, which the operating man is apt to overlook, namely that of economy.

The economical aspect of this question is admittedly of considerable importance to the Canadian News Print Industry.

Much has been said and printed concerning the future of this industry, which in its present form is altogether dependent upon the forest for its raw material.

On ore point, most authorities appear to agree however, and that is that our available spruce forests are being slowly depleted.

This means of course longer log hauls, more expensive driving and a higher priced wood at the mill.

In the mean time we are allowing the pine to rot in our woods.

In the pine we have a tree, which grows in sandy soil, where the spruce will not grow, and which reaches a commercial size in from 30-40 years, while it takes the spruce around 70-80 years to reach the same size, and it is evident that if the pine can be used in the manufacture of newsprint together with, or in the place of spruce, it would be of considerable economical benefit to the Canadian Newsprint Industry.

This question has been in the mind of the management of the Compnay, with which I am connected, for some time, and during the early part of last year it was decided to find out whether this particular nigger in the wood-pile really is as black as he is generally painted.

I think it will be of interest to establish here what Jack Pine is. To the causual observer it seems to have as many names as a cat is reputed to have lives. You take a block of wood to the wood expert — there is at least one around the mill — and ask him what species that is and he perhaps tells you that it is gray pine. Another may say it is pitch pine, a third cypress, and if you are full of guile, you may take the same piece back to the first expert the next day, and this exception, during the 12 years we were using Jack pine sulphite on all the machines, the mill was running exceptionally well. It is of course evident of pine growing in this province, to wit: White pine or Pinus Strobus and Jack pine or Pinus divaricata. Of these White pine grows principally in the Ottawa and Matawan Valleys, while Jack pine predominates in the St. Maurice and Abitibi Valleys. In addition there are found scattered stands of red or Norway pine (Pinus Resinosa).

The later species is however found in such small quantities as to be of no consequence, being only about 1-3 of one per cent of the total yearly cut.

As the pine used during our experiments came principally from the St. Maurice Valley, it is thus apparent that it really consisted of Jack pine.

During the experiments, which will be described below, the Jack pine was used in the sulphite process principally, on account of the practical difficulties in the way of collecting enough pine to run the whole groundwood mill over a sufficiently long period.

It was at first of course necessary to proceed very slowly, as we had no previous experience in cooking Jack pine, except for occasional runs of from 10-15 p.c. mixed with spruce.

Table No. 1. Digester Data of Jack Pine Cooks.

DATA	Monthly	Cooks	No.
	165	16	109
Date	Feb. 28	Mar.7	Mar.16
Moisture of chips %	36.0	39.0	43.9
Steaming time Hours	10.45	9	8
Filling time Mns	40	30	30
Acid pumping time "	15	15	15
Total cooking time Hrs	11.55	10	9
Cooking acid:-			
Total SO_2 %	6.00	6.20	6.16
Combined SO_2 %	1.36	1.20	1.26
Free of total SO_2 %	77.3	80.7	79.3
Acid temperature °C.	34	32	32
Steam pressure on main line Lb./sq."	114	114	116
Steam temperature deg.F. superheat	158	150	140

	% SO_2		% SO_2		% SO_2	
	Tot.	Comb.	Tot.	Comb.	Tot.	Comb.
Acid test, after 3 hours	...	...	4.02	...	4.22	0.82
4 "	4.12	0.92	...	...	3.30	0.88
5 "	3.18	0.86	...	...	2.06	0.31
6 "	3.44	0.70	2.98	...	1.90	0.24
7 "	3.26	0.60	2.24	...	1.10	...
8 "	2.86	0.46	...	...	...	...
At blow	0.60	...	0.60	...	0.14	...
Top relief opened after Hrs		3.15		2.00		2.00
[illegible] commenced after "		7.30		5.00		4.45
[illegible] finished after "		8.15		6.45		5.30

The digester was up to pressure in 3..15 hrs and the maximum temperature 144 deg. C was reached after 10 hours.

In the first column of table No 1 the cooking data of this cook are given.

This first cook did not look particularly good. The color was very poor and there was a larger percentage of short weak fibres. The following cook was greatly improved in both appearance and quality of fibre. The steaming time of this cook was 10.45 hours, but the maximum temperaturre was reached one hour earlier than during the first cook.

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[*] Paper read at the annual meeting of the Technical Section, Canadian Pulp and Paper Association, Ritz Carlton Hotel, Montreal, Jan. 25 & 26, 1922.

Having thus been established that Jack Pine could actually be made in to sulphite on a commercial scale, we were ready to continue the experiments, and to determine the following points. The most suitable cooking time, the yield of pulp per cook, and the action of the stock on the paper machines.

In all 587 cords of wood was used, the paper mill was run on Jack Pine sulphite during 12 whole days and 1975 tons of paper made.. During this time the sulphite mill was run entirely on Jack pine.

We soon found that we could materially cut down the steaming time from 11 hours, and through continual experiments, we finally reached a steaming time of 9 hours.

Thirty-four cooks were then made with steaming time varying from 8..45 hours to 9..45 hours, depending on the strength of the acid. Column 2, Table 1, gives the cooking data of a representative 9 hours cook. cook.

Table No.2. Yield of Air Dry Sulphite from Jack Pine

Date	No.1 & 2 Tons	No.3 Tons	No. of cooks	Per cook No.1 & 2 Tons	No.3 Tons.
March 3	60.29	2.52	7	8.63	0.36
" 4	72.48	2.97	7	10.35	0.42
" 5	67.45	4.36	7	9.66	0.63
" 6	27.71	2.57	3	9.24	0.85
" 16	59.71	7.23	6	9.94	1.22
" 17	52.45	6.71	7	7.50	0.90
" 18	64.99	8.36	7	9.30	1.19
" 19	27.65	2.56	3	9.23	0.85
" 20	25.66	3.43	3	8.59	1.14
" 21	83.87	6.42	8	10.48	0.80
			Average:	9.34	0.82

	No.1& 2 Tons	No.3 Tons	Total Tons	Screening %
Yield from 9 - 10 hrs cooks	9.34	1.62	10.96	14.8
Yield from 8 hrs cooks	8.42	2.54	10.93	23.2

In examining these figures, we find that the acid was of very good strength, having a combined SO_2 of 1.20 per cent with free SO_2 equal to 80.7 per cent. The digester was up to pressure in 2 hours while the maximum temperature 145 deg. C. was reached after 8 hours.

The wood chips during the tests had an average moisture contents of 38.7 per cent.. The size of the chips was our standard containing around 20 per cent. 1-2'', 60 per cent 3-4'' and 20 per cent 1''

We were not, however, satisfied that we had reached the shortest possible cooking time in the 9 hours cook, so we ran off one cook in 8 hours. The data is shown in column 3, Table 1. .

Part of this cook was digested, the quality of fibre being good.. .A very large part of the wood was, however, not at all or only partly cooked. The percentage of screenings was very high, as will be shown further down. The circulation in the digester was very good during this cook, the temperature following the standard curve set. There was no evidence of too quick turning of the liquor, and at the blow the liquor was of normal color and smell.

It is therefore evident that the low yield of properly digested fibre was due to the relatively slow penetration of the pine chips. The uncooked part consisted mainly of large chips only partly attacked by the acid. This fact suggests the possibility of obtaining a better yield with a relatively short cooking time by using chips considerably smaller than what at present is the standard for spruce chips.

Table 2 shows the yield of sulphite obtained from Jack pine.

It should be noted that during the period, March 3rd. to March 6th., owing to trouble with our refining system we could not recover all of the screenings.

The average yield of No. 3 sulphite per cook from March 16th. — 1.62 tons — therefore gives the more nearly correct figures for the amount of screenings obtained.

A total yield per cook of 10.96 tons was thus obtained from Jack pine, with a cooking time of 9-10 hours, and with a cooking acid of about 6 per cent.. total SO2.

The 8-hour cook gave a total of 43,711 lbs of No. 1 and 2 sulphite, 38.50 per cent. air dry test, or a dry weight of 8.42 tons. .

The screenings amounted to 2.54 tons, of 23.2 per cent.

From the results obtained during these our experiments, it is apparent that a fair yield of pulp is obtained with Jack pine.. The screenings are somewhat higher than with spruce, when steamed the same length of time and under the same conditions, say about 8 per cent for spruce against 14 per cent for Jack pine.

Let us now see how the Jack pine sulphite behaves on the paper machines.

An investigation of the fibre does not show in any way that it is unsuitable for News Print. The fibre is long and rather coarse but of very good strength.

As for pitch, some rather interesting figures are shown in table 3. From a chemical point of view pitch is not easily defined.

It is an oxidation production of resins and balsams in the wood. It is soluble in alcohol and ether, and thus the amount of alcohol-ether extract is a measure of the amount of "pitch" in the wood or the pulp.

The figures in this table indicate that Jack pine does not contain a great deal more "pitch" than does spruce.

On comparing the figures giving the amounts of alcohol-ether extracts obtained from spruce sulphite made during 1920 with those of Jack pine sulphite, it is also found that there is really not such a large amount of "pitch" in the latter as to make any appreciable difference on the paper machines. This is actually born out by our experience during the time we were running on Jack pine.

Table No.3 - Pitch Contents in Wood and Sulphite Pulp

Description	Ether Extract %	Alcohol Extract %
Fresh Spruce	0.79-1.80	0.70-1.94
Jack Pine Chips	2.10	1.43
Jack Pine Sulphite Lap Cook #20	2.23	0.42
" " " " " #24	2.02	0.43
Average of 83 samples of Belgo Sulphite, June 1st - Oct 15th, 1920	1.56	-
Belgo Sulphite, claimed to cause pitch troubles on paper machines.	1.27	0.38

The first day we really did have a great deal of trouble on the machines. This was, however, due to causes, which will be discussed further down. With this exception, during the 12 days we were using Jack pine sulphite on all the machines, the mill was running exceptionally well. It is of course evident that whatever troubles might be expected would show up during this length of time. .

Unfortunately it is not possible to exhibit all the time recorder charts here, but I have one chart which I wish to show.. This chart is typical of the run, and shows clearly that the machines were running exceptionally well. (charts will be printed later).

In table 4 is further given the number of breaks, lost time and speed of the machines in 24 hours during the experiments, compared with those of several other periods. An examination of this table shows that the number of breaks and time lost was actually less than during the other periods compared, while speeds compares very favorably.. The wire seams were cleaned on an average once a day, while the washing up was done very much as usual.

Table 5 shows finally that the paper production did not suffer during this time and that the bursting strength and moisture were well maintained. In regard to the Mullen test it should be noted that during the run the basis was 0.56 per cent below 32 lbs.

From what has been related above, I think we can draw the conclusion that it is quite feasible to use Jack pine in the manufacture of newsprint. At least that is our experience.. We are also convinced that Jack pine is not synonymous to pitch trouble.. Of course this applies to seasoned wood.

Green wood is apt to cause a great deal of trouble on the paper machines, probably due to the fact that in green wood the resinous matter is in a more or less fluid form, while in seasoned wood it has been oxidized to a hard brittle substance.. This applies, however, also to spruce, and in the speaker's opinion green spruce is as apt to cause pitch trouble on the paper machines as pine is. .

Table No.4 Comparison of breaks, time lost and speed of Paper Machines per 24 hrs. during run with Jack Pine Sulphite.

		Period of run with Jack Pine Sulphite (Feb - March)	Period Feb.1 to 15, 1921	Aver Jan 1921	Aver Jan 1920	Aver Feb 1920	Aver March 1920
No.I Machine							
No of breaks		9	17	19	18	23	17
Time lost	Mns.	48	82	104	85	114	84
Speed	F.P.M.	636	626	628	623	621	625
No. 2 Machine							
No of breaks		6	13	13	27	17	18
Time lost	Mns.	30	68	74	140	86	78
Speed	F.P.M.	625	629	628	603	603	599
No.3 Machine							
No of breaks		16	18	19	16	16	18
Time lost	Mns	83	76	89	76	63	88
Speed	F.P.M.	636	646	644	625	625	625
No. 4 Machine							
No of breaks		13	15	19	24	22	20
Time lost	Mns	71	88	89	121	110	100
Speed	F.P.M.	650	662	663	622	648	651
All Machines							
No of breaks		44	64	69	84	78	73
Time lost	Mns	232	314	366	422	373	350
Speed	F.P.M.	637	636	640	656	624	625

I said above that we do not consider Jack pine synonymous to pitch trouble.. On the contrary, we have found that Jack pine often is blamed where it is not really the guilty party. To illustrate this, I wish to show a time recorder chart from February the 24th, the first day of our experiments. An examination of the chart shows that during the forenoon of this day, the paper mill was having any amount of trouble, from, what was at first thought, pitch in the Jack pine sulphite. We soon found, however, that this was not really the case, because, through a misunderstanding in the wood-room the Jack pine had been sent to the groundwood mill instead of to the sulphite mill.

The groundwood mill not being prepared for this sudden invasion of Jack pine, did not have the stones properly dressed, with the consequences that for some hours, a totally insuitable grade of pulp was supplied to the paper machines.

An examination of the stock showed that it contained an excessive amount of short and floury fibres together with a large amount of short coarse fibres, the worst possible combination for our machines. It acted very "sticky" on the wires and couches, did not form properly and caused innumerable breaks as is clearly indicated on the chart reproduced.

This fact gave us the clue to what we believe in a great many instances is the real cause, of so called "pitch" troubles, to wit-short and floury stock. We have from time to time had similar troubles on the machines and we have found the same answer — short and floury stock. For some time we have been testing the freeness of the groundwood stock all through the twenty-four hours, and we have found that a drop in the freeness below a certain point will invariably cause these troubles on the machines. The wire becomes dirty, and has to be steamed and the paper sticks to the clothing. These troubles disappear as by magic the moment the stock is freed up.

Table No.5 Comparison of Production, Basis, Test, Moisture and Sulphite used for paper machines per 24 hrs during run with Jack Pine Sulphite.

		Period of Run	January 1921.	Year 1920.
No. I Machine	Tons	43.79	41.57	42.10
2 "	"	41.75	42.46	41.39
3 "	"	52.46	53.44	51.78
4 "	"	70.49	72.63	70.80
All Machines	"	208.49	210.10	206.12
Basis	Lbs	31.82	32.03	32.17
Test	Lbs/sq.Inch	9.42	9.17	9.51
Moisture	%	8.79	9.08	8.94
Sulphite in Paper	%	28.04	27.47	26.47

Although we have not so far been able to run the groundwood mill altogether on Jack pine, we have been using considerable amounts of Pine mixed with spruce, and we have found the above to be true also in this case.

On some occasions we have been using according to our observations as much as 35 per cent of Jack pine in the groundwood mill, and we have had no troubles with pitch as long as the stock has been kept up. Of course the stones have to be dressed properly to take care of the pine.

A man with the rheumatism joined the Christian Scientists. He was asked, six months later, "Did Christian Science cure you of rheumatism?" "No, but rheumatism cured me of Christian Science."—*Life.*

There is no freedom without religion, no religion without worship, and no worship without the Sabbath.—*Count Montalembert.*

The Use of Clean Water as a Preservative for Storing Mechanical Pulp

R. J. BLAIR, Pathologist and E. PARKE-CAMERON, Associate Chemist. Forest Products
Laboratories of Canada, Montreal.

Red-rot and moulding in pulp while in storage occur so frequently that every one who has ever stored pulp is familiar with this source of loss and waste. Until a short time ago very little had been done towards solving the problem and finding a way to control the trouble.

Moulds and Fungi to Blame for Losses.

The various forms of pulp deterioration are due to the action of wood-destroying fungi and moulds. Each type of trouble-maker is a simple kind of plant and each is able to nourish itself with the substance of the pulp. In order to develop properly the fungi and moulds have other requirements in addition to food. They must have air, a proper amount of moisture and sufficient warmth.

If we undertake to keep our pulp free from attack by any of these invaders it is necessary to store the material in such a way that one or more of the requirements of the mould or fungus plant will be lacking. The food material for the organism may be poisoned by spraying the pulp with a preservative substance. Experiments in this direction have been carried out at the Forest Products Laboratory at Madison, Wisconsin and also at the Kenogami Mills of Price Brothers and Company. A large number of chemicals was used and the results of the experiments indicated that some of the materials employed were satisfactory and could be used commercially at a reasonable cost. However, if one adopted such a method of handling pulp for storage it would require the use of new raw materials and extra labor and equipment. Finally the paper maker might object to the presence of objectionable chemicals in the pulp.

It seemed that some of the other necessary conditions for fungus development lent themselves to experimental study and it was decided to find out something about the moisture requirements of the moulds and fungi. Any of the ordinary plants which grow in our gardens must have a certain amount of moisture in order to develop properly. If the supply of water is too scant the plant withers up and dies, while if there is too much moisture the plant is drowned. The same would be expected to hold true in the case of the organisms which injure pulp. Therefore pulp stored with either too little or too much moisture to permit of fungus development should be safe from attack.

Experiments with Wet Storage.

It thus remained to make a choice of experimenting with pulp either too dry or too wet to spoil. When dried too much, ground wood is weakened and is apt to be lumpy when beaten. Storage conditions in a state too wet to spoil remained as a field for experiment.

Facts already known indicated that such methods of storage were well worth a trial. It is an accepted fact that wood which is immersed in water or is covered with water-saturated soil is not destroyed by agencies which bring about ordinary decay. Wooden piles which were used for supporting the homes of pre-historic Lake-Dwellers have been recovered in good condition from some of the Swiss lakes. On this continent trunks of trees removed from beds of rivers, where they had remained undisturbed for hundreds if not thousands of years, have been converted into merchantable lumber.

When made into groundwood pulp the only change brought about in the wood is to separate it into fibres or small fibre bundles and it would be reasonable to expect that if stored in water in this finely divided condition there should be no more tendency for it to rot or mould than in the instances just cited. Accordingly an experiment was planned and equipment made for carrying on the work. A number of tanks was built in each of which several laps or sheets of pressed pulp could be placed. For each tank there was a valve for supplying water as required. Each tank was provided with a combined plug and overflow pipe which either permitted the water to drain away quickly or prevented the tank from overflowing when water flowed into it continually.

In June 1920 the experiment was started and several lots of groundwood were placed in the tanks. Pulp was used in the form of slush, laps and pressed sheets. In some of the tanks the water was changed once a week, in others the change was made every day while in the remaining tanks water entered in a small stream which was never shut off.

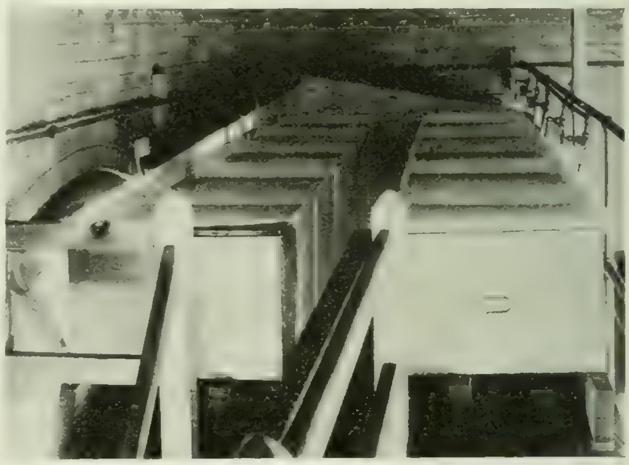

FIG. 1.
Ten of the tanks used for holding pulp stored in water.

went into storage, it was decided to carry out some tests
went into storage, it was decided to carry out some tests on it. In appearance the stored pulp was quite attractive as it was clean and similar to freshly-made pulp. On the surface there was an accumulation of a dark colored slime but this material was entirely superficial and did not penetrate into the body of the pulp. At the time the experiment was started some pulp was left over which was not required. During the time the experimental pulp was in storage these extra laps remained in the same room. They deteriorated so seriously that at the end of the storage period they offered no fair basis for comparison with the pulp stored in water.

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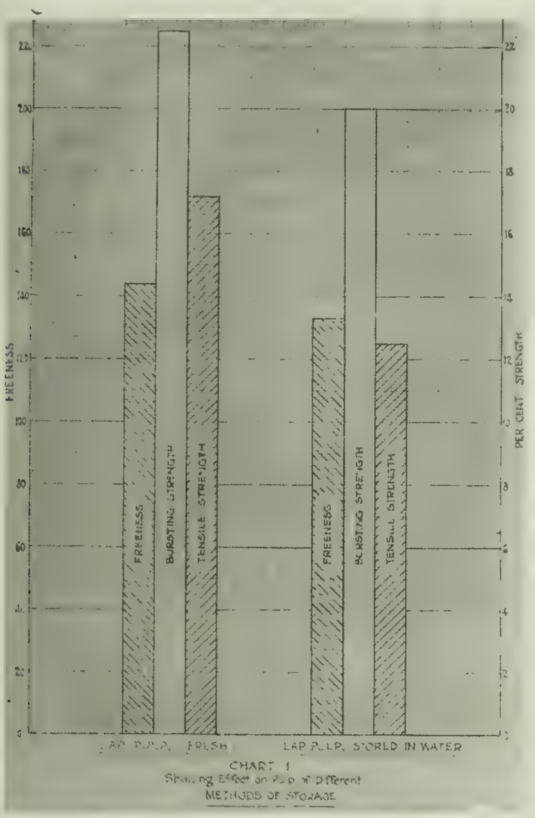
* Paper read at the annual meeting of the Technical Section, Canadian Pulp and Paper Association, Ritz Carlton Hotel, Montreal, Jan. 25 & 26, 1922.

Cold Storage Experiment.

In addition to the water storage experiments, another one was tried at the same time with pulp in cold storage. Laps of three different kinds of freshly made groundwood were crated up and sent to a cold-storage warehouse where they were held at a temperature of from 34 deg. to 36 deg. F. during the same interval of seventeen months. At the end of that time this lot was tested in a similar way to all of the other lots. The results obtained from these tests are to be found in the tables and charts which accompany this paper.



Methods of Testing.

The tests carried out consisted of Determinations of Freeness, Bursting Strength and Tensile Strength.

Sampling.

An average sample was taken from each tank of stock, thoroughly stirred, and the consistency of it determined in the following manner.

One thousand grams of stock were accurately weighed out in a tared beaker on a large chemical balance. The stock was then poured on to a large Buchner funnel and the water drained off by suction, a piece of well washed bleached calico being used as the filtering medium. The pat thus formed was transferred to a large clock glass, the calico carefully stripped off, and the pat dried in an oven for three hours at 100 deg., 105 deg. C., cooled in a dessicator, and weighed.

From the consistency thus obtained the original sample was diluted to 5 per cent and transferred to the disintegrating machine.

Disintegration.

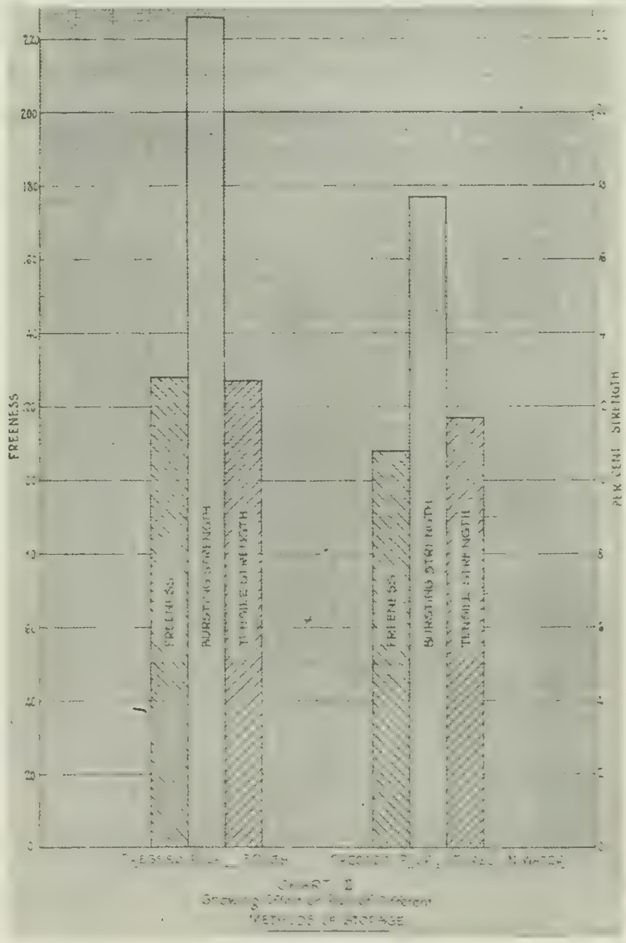
The desintegrating machine consisted of a three inch propeller driven at a high rate of speed, (1,700 r.p.m.) inside and close to the bottom of a large inverted bell jar. The object was to open out the stock without any appreciable beating action. This was found to be best accomplished by means of a treatment of twenty minutes, six litres of 5 per cent. stock being used in the machine. This method was adopted as uniform for all pulps used, so that the beating action, if appreciable, would be constant for all samples.

After disintegration the sample was carefully diluted to 0.5 per cent consistency by weighing. It was then ready for the freeness tests and the preparation of the test sheets.

Determination of Freeness.

All freeness tests were carried out at a constant temperature of 20 deg. C. which was maintained by means of a small copper steam coil, and frequent stirring. The freeness tester employed was a modification of the Green apparatus installed in the Laboratories some years ago. The procedure was as follows:

One thousand grams of 0.5 per cent stock were carefully weighed out and transferred to the chamber of the tester, the top screwed home, and the pet cock in the lid closed. The apparatus was then placed in its rack over the funnel, a graduate placed under the side discharge of the funnel, the bottom of the chamber released as quickly and uniformly as possible, the pet cock in the lid opened, and the stock allowed to drain.



Five tests were run for each tank of stock and the conditions of each test kept as constant as possible throughout the whole series of determinations.

After the flow from the side discharge had ceased, the stock was transferred to a fibreware pail, the chamber of the apparatus thoroughly rinsed into it, the discharge from both orifices of the funnel also added, the whole diluted to approximately five litres and poured into the sheet machine.

Preparation of Sheets.

The sheet machine used was one made from the plans of K. G. Wilen of the Wayagamack Pulp & Paper Co. and described by him at the last annual meeting of this Section on Jan. 19th 1921. One slight modification was introduced, that of making the screen plate separate from the body of the machine, thus facilitating the changing of the wire when necessary, but in no way affecting its efficiency. During these tests and throughout a large number subsequently carried out the machine has proved highly satisfactory and it will probably be found difficult to improve upon materially as a device for making standard test sheets.

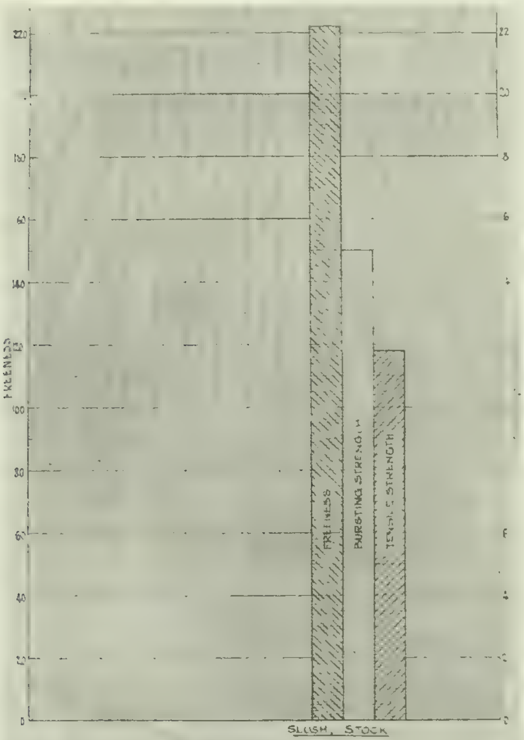


CHART III
Showing Effect on Pulp of Different
METHODS OF STORAGE

It is unnecessary to describe this machine in detail here as a complete description of it may be found in an article by Mr. K. G. Wilen in the Pulp and Paper Magazine for Jan. 20th 1921.

After pouring the stock into the chamber of the machine as described above it was allowed to stand until all eddy currents had ceased. The valve was then opened and the sheet formed on the wire. The sheet was couched off on a piece of machine felt and both sheet and felt were placed on a piece of heavy brass plate. A second piece of felt was placed over the sheet and another brass plate laid on top of all. The whole was then minutes with the press as hard down as it was possible to turn it.

After pressing, the brass plates and one felt were removed, and the sheet allowed to become air-dry while remaining on the other felt. This was done because the weakness of the sheet while wet rendered its removal from the felt without damage extremely difficult. The sheets were allowed twenty-four hours drying on the felts and an additional twenty-four after being removed and before being tested.

The sheets being thoroughly air-dry were cut to a seven-inch square and carefully weighed. From this weight the ream weight was calculated, taking a ream as 480 sheets 24 inches x 36 inches.

Methods of Testing.

A strip one inch in width was ruled diagonally across the sheet and reserved for the tensile tests, the remainder of the sheet being used for Bursting Tests.

Five bursting tests were made on each sheet by means of a Mullen machine, thus giving an average of twenty-five bursts for each lot of pulp. The percentage points per pound as calculated in the usual manner.

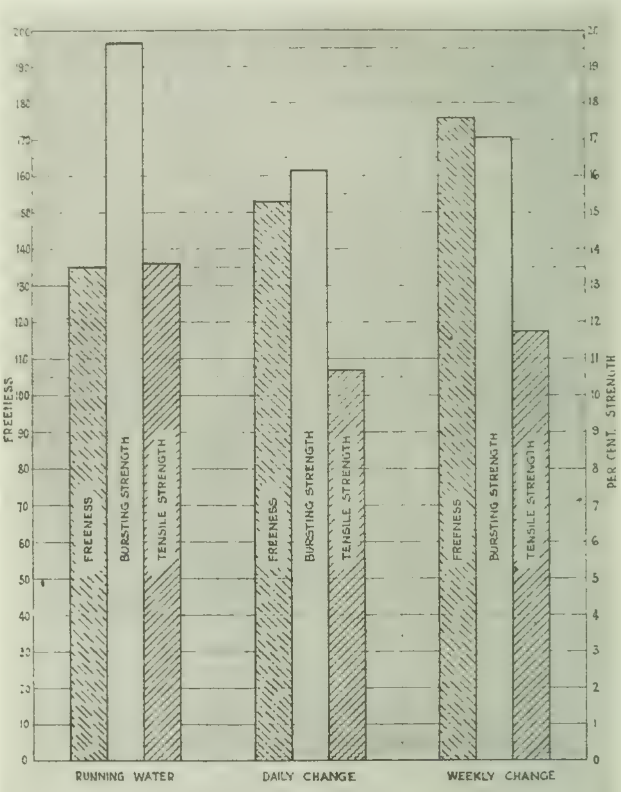


CHART IV
Showing Effect on Pulp of Different
METHODS OF STORAGE

The tensile strength was determined on a small machine designed by Mr. L. N. Seaman formerly of these Laboratories and described by him in an article in the Pulp and Paper Magazine October 2nd, 1919. The machine, though somewhat crude, gave at least comparative results for the different lots tested. It is well to point out that the results of the Freeness and Tensile Tests are only of value for comparison in the work actually carried out. Freeness testing is anything but standardized at present and the results of our method of tensile testing can in no way be compared with those obtained for instance by a Schopper instrument under the same conditions.

The method of computing the tensile strength is perhaps rather unusual, but it is simply a calculation similar to that of percentage points per pound from bursting strength. This method gave a figure which could easily be plotted and is not, we think, fundamentally unsound.

Presentation of Results.

Table 1 presents in detail average figures obtained from each lot of stock for all the tests made. Table 2 groups the results and presents the averages for the various groupings selected. Table 3 summarises the results presented in the charts.

TABLE.— I.
GROUNDWOOD PULP STORAGE.

Condition of Pulp	Sort of Storage	Result of test for: Free-ness	Burst-ing	Ten-sile
Lap	Running water	129	23.06	13.91
Lap	Water changed daily ..	133	18.55	11.95
Lap	Water changed weekly ..	137	18.72	11.72
Pressed Pulp	Running water	117	18.65	13.11
Pressed Pulp	Water changed daily . ..	94	16.87	9.59
Pressed Pulp	Water changed weekly ..	115	17.78	12.45
Slush—Stirred up daily	Running water	276	14.69	11.13
Slush	Water changed daily . ..	231	13.03	10.55
Slush—Undisturbed	Running water	159	17.25	13.75
Fresh Lap	.. ..	144	22.43	17.20
Freshed Pressed Pulp		128	23.62	17.72
Laps in cold storage		141	20.72	15.40

GROUNDWOOD PULP STORAGE—TABLE II.

Description of Storage	Results of tests for Freeness	Bursting	Tensile
Pulp laps in water	133	20.11	12.52
Pressed pulp in water . . .	108	17.76	11.72
Slush pulp in water	222	14.99	11.81
All pulps in running water	135	19.65	13.50
Pulp in water changed daily	153	16.15	10.69
Pulp in water changed weekly	176	17.06	11.76
Pulp in cold storage	141	20.72	15.40
Fresh Lapped Pulp	144	22.43	17.20
Fresh Pressed pulp	128	23.62	17.72

SUMMARY OF MATERIAL PRESENTED IN CHARTS.—TABLE III.

	Freeness	Bursting	Tensile
1.—Lap Pulp.			
Fresh..	144	22.43	17.20
Stored..	133	20.11	12.52
2.—Pressed Pulp.			
Fresh..	128	23.62	17.72
Stored	108	17.76	11.72
3.—Slush.			
Fresh..	...	.....	.....
Stored	222	14.99	11.81
4.—Stored in running water	135	19.65	13.59
Stored in water changed daily . .	153	16.15	10.69
Stored in water changed weekly..	176	17.06	11.76
5.—Lap Pulp.			
Fresh..	144	22.43	17.20
Cold Storage at 34 deg. 36 deg. F.	141	20.72	15.40

Summary and Conclusions.

1.—Of the pulp received only part was stored in water. The remaining laps and sheets were left in the building with the storage tanks and were freely exposed to the air. After seventeen months this latter material was found to be in very bad condition.

2.—Table III gives actual figures for the results shown in the charts. A comparison between fresh lapped pulp and that stored in water shows that after seventeen months there was slight deterioration in all cases. For pressed pulp the same condition held but was more noticeable.

3.—In stored slush stock the freeness was much higher than in the case with either laps or pressed pulp stored for the same length of time under the same conditions. and the strength tests were also somewhat lower.

4.—In making a comparison between different methods of water storage, running water apparently gave a better result than either a weekly or daily change.

5.—In cold storage little deterioration seems to occur.

6.—The results indicate that water storage is superior to air storage for groundwood pulp.

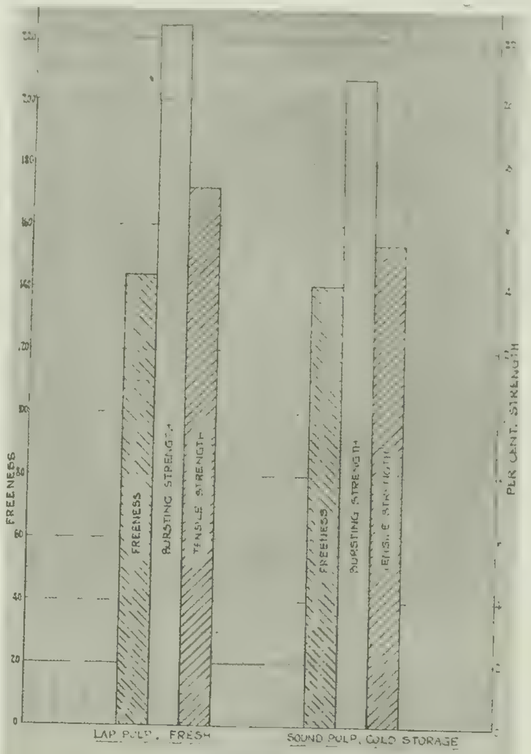


CHART V.
Showing Effect on Pulp of Different
METHODS OF STORAGE

Acknowledgements.

In conclusion we wish to thank the Laurentide Company, The Belgian Industrial Company, The Donnacona Pulp & Paper Company, Price Brothers & Company and the MacLaren Company for supplying the pulp used in carrying out this series of tests; also those members of the staff of the Forest Products Laboratories of Canada who prepared the charts, and furnished suggestions as to carrying out the experiments.

Mr. G. F. Steele has we are informed, severed his connection with the Canadian Export Paper Co. Ltd. Our readers will not be surprised at the news in view of recent developments in the personnel of the staff of the company. Under the reorganization, Mr. Steele continuel to hold, at least in name, the position of general manager, while Messrs. Crooker and Dawe carried out the duties of general manager and assistant manager respectively. It was understood that Mr. Steele had a contract with the Company which had several months to run. Apparently an arrangement has been come to under which the agreement has been terminated.

The St. Maurice Paper Company is now using a tractor in hauling logs on one of their timber limits in northern Quebec.

Mr. Geo. Chahoon jr., of the Laurentide Company, on January 17 left for his usual visit to Florida. He was accompanied by his family.

Safeguarding Shipments of Pulp To Foreign Ports*

C. R. HAZEN, Vice-President, Milton Hersey Co.

In the shipment of Hydrauric Pressed Pulp for export the Canadian manufacturers have at times had to meet claims for short weight and not infrequently these claims have been allowed, either because there was no means of checking up the shortages claimed or because the shippers assumed the claims must necessarily be just or because it seemed wise in order to retain the good will of the customer.

What is said in this paper refers to Hydraulic Pressed Pulp. How far what is said is applicable to other varieties of pulp depends probably upon one thing only,— in what respects the variety in question approximates Hydraulic Pressed Pulp.

Losses in Shipping Pulp.

Of losses there are two kinds — actual and apparent. By apparent losses we mean supposed losses that are due to errors in the shipper's statement of weight of air dry pulp. These may be due to actual error in sampling through faulty methods, or insufficient or uneven selection of bales from which to take samples. One may invoice 230 lbs. to a bale believing the shipment contains this amount when it actually does contain 220 lbs.

Again the system of testing the pulp at the mill may be either incorrect or inadequate and the tests indicate an erroneous average air dry weight either because the sampling is faulty or not taken from a sufficient number of bales so distributed as to make certain of a representative sample. The difference between this mill test and a correct test may then show an apparent loss to the shipper although none has actually been experienced.

Of the actual losses there are only two that require serious consideration, — the loss due to the abrasion of the bales from repeated handling in transit, and the loss due to methods of sampling followed in determining the air dry weight at the consignee's mill.

The loss by abrasion is not avoidable but may be minimized. This loss will be greater if the bales are rough and uneven on the ends and are loosely tied or poorly pressed. It may be minimized by making tight bales with a minimum of water and using a lath or light slat at the top and bottom edges of the bales. The Scandinavian pulp bale is flattened at the enrs as though it had been submitted to pressure. This practice seems to prevent much abrasion.

The ends do not tear away as they do where they are left rough. It might pay to put a wrapper over the ends of the bales.

If the pulp were sampled with proper regard to the clause in the contract which calls for the selection for sampling purposes of only intact normal bales there would be no occasion to discuss this. In sampling pulp at their mill the consignees may be scrupulous regarding the interests of the Canadian shipper and sometimes are, but you may fairly expect them to look after their own interests first. If an independent sampler is hired to test the pulp the foreign buyer hires him and pays him, and this buyer is his meal ticket. We do not insinate that the independent sampler is going to be intentionally unfair and we don't think so. But he is going to look after the interests of the man or the company who employs him and your interests do not coincide with his.

In one large mill to which pulp was shipped the bales for test were not selected by the tester, they were taken eight at a time from a few car loads, some 200 out of 17,000 bales and sent to the mill for test. No attempt was made to pick intact bales by the foreman who took the sample bales from the shipment.

The independent tester selected laps and cut wedges following the usual routine of the Wedge System and made his tests on these. He vouched for the tests and the representative character of the results although he had no part in picking the bales he tested. It was the same with this mill's own tester. He tested the bales sent him by the foreman. In this instance their tests showed 218 lbs. of air dry pulp per bale, where the Canadian mill and our own man found 228 independently, a difference of 85 tons for which they promptly made claim. What chance has the Canadian mill that leaves its testing in the other fellow's hands to handle in this way?

The Canadian shipper who leaves the testing to the buyer or the umpire nominated by the buyer has no right to complain if the tests of his pulp favor the buyer; the buyer looks after his own interests thoroughly and the Canadian mill doesn't.

The details of the tests carried out during the past summer cover several shipments and are as follows:

Looking over all these results it is apparent that the low net weights found by the consignees or the Independent samplers which have resulted in claims for shortages are due to the improper selection of bales rather than to actual deficiencies.

Our work has proven clearly that the system or method of cutting the samples and the methods of drying are not in any way responsible for the differences. The records of the tests show plainly that as a rule all chemists found approximately the same percentage of moisure in the pulp. They show further that where differences are found they occur in the wet weights of the bales selected for test. The bales selected by the consignees are, except in the case of one shipment, lighter and in some cases much lighter than we found for the average of intact bales from the same shipment. The mill operative may not have intentionally picked out light weight bales for the tester. The custom of picking up eight bales at a time and weighing them in batches precludes the rejection of many bales that are abraded or broken. That this results in tests unfavorable to the Canadian mill is beyond question. Further the method of selecting bales from a very small section of the total shipment does not give representative sampling.

These are the methods we found were being used. How can we best safeguard the Canadian shipper against such losses? First each Canadian mill should arrange to have a representative to take a joint sample with the representative of the purchaser of each cargo. Whatever terms of contract are agreed to, both the buyer and the Canadian mill owner will insist that their own tests are correct. Either a joint test must be made on arrival of the cargo or the Canadian mill must leave its interests to the care of a man who is very busy these days in looking after his own.

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*Paper read at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Ritz Carlton Hotel, Montreal, Jan. 25 & 26, 1922.

TABLE I. COMPARISON OF TESTS.

Cargo	No. Bales shipped	Test made at	Kind of pulp	No. of tests	Wet Weight	Dry Weight	Air dry %
# 1	12,756	Canadian Mill	Old	60	377.98	219.32	58.16
			New	176	405.5	240.46	59.30
			Average				
		(1st) Consignee's Mill	Whole cargo ..	200	381.8	214.34	56.14
		(2nd) Consignee's Mill	Whole cargo ..	200	381.9	218.33	57.17
		Consignee's Mill	Old pulp	100	372.01	200.59	*53.92
		Consignee's Mill	New pulp	120	382.38	218.19	57.06
# 2	15,444 mill	Canadian Mill	New	578	405.8	234.4	57.76
	2,180 yard		Old	—	380.1	212.4	55.88
			New Yard		381.9	234.9	61.50
			Average		403.2	232.77	57.73
		Consignee's Mill	Old pulp	80	353.7	702.7	57.31
			New	360	378.89	215.47	56.87
			Average		370.5	213.2	57.54
# 3	6,810 mill	Canadian Mill	Average	386	372.0	233.3	62.70
	1,280 old		New		405.	240.	59.25
	9,107 yard		Old		361.	224.86	62.28
		Consignee's Mill		344	368.41	218.58	59.33
		Milton Hersey Company		344	368.41	218.58	59.32
# 4	4,876 mill	Canadian Mill	Mill	147	404.88	235.25	58.29
	10,059 yard		Old	122	377.35	224.21	59.41
			Average	269	386.8	227.81	59.17
		Consignee's Mill		300	367.75	218.44	59.40
		Milton Hersey Company		89	381.30	226.53	59.41
# 5	7,710 mill	Canadian Mill	Mill	393	405.38	234.56	57.85
	11,758 yard		Yard		383.19	222.83	58.14
			Average		386.34	224.69	58.16
		Consignee's Mill		360	377.21	221.38	58.69
		Milton Hersey Company		100	383.04	224.00	58.48
# 6	20,499	Canadian Mill		286	373.56	219.41	58.73
	(All yard)	Consignee's Mill		400	378.24	217.07	57.39
		Milton Hersey Company		100	369.55	214.41	58.02
# 7	10,000 mill	Canadian Mill	Yard	289	392.98	228.64	58.18
	13,362 yard		New	224	405.47	240.74	59.37
			Average		398.5	233.78	58.66
		Consignee's Mill		150	395.94	230.71	58.27
		Consignee's Mill		150	395.93	230.70	58.27
		Milton Hersey Company		250	395.44	232.87	58.89
			Special Test on 24 Bales.				
			"A" Aug. 2	12	407.16	237.94	58.44
			"B" Aug. 3	12	407.91	243.19	59.62
			"A" Sept. 19 ..	12	370.5	227.45	61.40
			"B" Sept. 17 ..	12	406.92	240.08	59.0

"B" Bales were exposed to rain and were wet.
"A" Bales were protected by those above and were dried out.
Note the loss in Gross Weight and the Air Dry percentage.

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* Shipped as deck cargo.

The Safe Guards.

The shipper and the buyer are going to make each his own tests whatever the specifications or terms of sale. The simple and most desirable plan would be to include in the contract of sale a stipulation that a joint test or an independent test shal be made at the Canadian mill, settlement to be based upon the results. With Scandinavian competition and competition at home as it is, however, this may be difficult. If this cannot be done the best alternative is to send over a man to make joint tests on arrival of each shipment. Our experience shows that it pays to do so.

Marking Bales.

All bales should bear a distinctive mark of identifications and a consecutive number such as P-1, P-2, etc. The "P" being any letter of the alphabet and varied with each shipment. This serves by its distinctive form or size to identify the stock from any mill and also because it offers twenty-six series of numbers instead of only a long single one; it serves to simplify the numbering.

A slip bearing a successive number should be slipped below the top lap by the baler before the wires are tied on the bale. Any desired system may be used. The point urged is that some system of numbering should be used and the one indicated is simple and cheap.

In large shipments it is very much in the interest of the shipping mill to number the bales in such a way that they may be easily identified and the numbers borne by each of the bales selected for test recorded. This will serve first to show that the bales selected for test have been selected as they should be, regularly over the entire cargo, instead of from only a portion of it as is likely to be the case if no check is put upon the sampler. It will also serve to show from what parts of the shipment these have been selected.

Suppose that a shipment of pulp is made up, as frequently occurs, from three sources at the mill—old pulp piled in the yard, newer pulp piled in the yard and pulp direct from the mill. With large shipments such as vessel cargoes the bales remain segregated and do not get mixed up to any great extent. A sampler in selecting bales may get most of them from one lot.

Assume a shipment is made up as follows:

6,800 Bales from the Mill. Average air dry wt. 233.

1,200 Bales from an old pile in the yard. Average air dry wt. 225.

9,000 Bales from a new pile in the yard. Average air dry wt. 240. Total 17,000 bales.

It is an extremely important thing that the bales selected for test should be selected proportionately from each of these lots. Without any system of numbering the bales this is impossible when the shipment reaches its destination, and a claim for shortage is likely to follow.

With these figures still before us it is very obvious how easily, because of the variations in wet weight and through no carelessness on the part of the sampler, the bales may be selected largely from the lighter or the heavier group to the considerable disadvantage of the Canadian mill. Nor can we dismiss it by thinking that it will somewhow average up in the long run.

The experience we have available distinctly indicates that it most emphatically does not average up, and that the contrary is the case, at the cost of the Canadian mill.

Wedge System of Sampling.

Because it is generally accepted as the Standard Official Method and is the Official Method of this Association as well as being one of the approved methods of the American Pulp and Paper Association we used only the Welge System of sampling.

The Disc Method is frequently used not because it is the best but because it avoids the labour and confusion caused by opening the bales. The fact that the Disc System confines the sample entirely to the sheets or laps that are within three inches of the surface of the bale condemns it as unrepresentative. Another point regarding disc sampling is the painfully laborious method of cutting the discs with a brace or breast drill. I commend it with my compliments to anyone who has not tried to cut discs from about a hundred bales of dry pulp. The plain truth is you cannot rely upon the average assistant to cut his samples to the full required depth — even if they were representative. And I am personally aware that some disc sampling has not been properly carried out.

Simplicity in itself is an advantage in any method but a method should not be adopted as a basis of settlement for this cause which is objectionable upon technical grounds. Out of my experience I would not care to make a settlement upon sampling done by the Disc System.

On none out of the shipments etsted did the samplers, either mill employee or independent sampler use a template in cutting his wedges from the laps. They all cut by guess. In their article in the Pulp and Paper Magazine of July 21st, 1921, on "The Testing of Shipments of Wood Pulp for Content of Air Dry Pulp", the Emerson Laboratory go on record to the effect "It is important that these wedges be cut accurately using a measure in each case and that the point of the wedge be not lost. A variation of 1" in the total length of the wedge will cause an alteration of the total moisture found of one to two per cent."

We found the use of a template is usually neglected as being unnecessary. Where one can eliminate any possibility of error it should be done. Errors of judgment in cutting are entirely eliminated by using a template and that is a sufficient reason for insisting on its use. Further it makes the cutting of the wedge easier to accomplish.

When a bale is stacked for a time it dries out. In a bale that has thus dried the outside of the bale is of course driest while the centre contains the greatest proportion of moisture. A bale from an old pile is therefore in some such condition as the wedgt cut from it would indicate.

If the wedge is 18" long and 2½" wide at the base, and a line is drawn parallel to and 3" from the base, we have total area = 18.75 sq. in. Area small triangle = 15 sq. in. Actual air dry pulp = 64.7 per cent. Air dry in butt = 80 per cent. Air dry in small triangle = 60 per cent. Air dry shown if dry butt of wedge is removed 60 percent.

Now let us suppose this bale is started to its destination. It is lifted from the mill storage pile to the car. It is run to the dock on the car and dropped by a crane into the hold of a boat where it is stowed. It is carried to destination and here it is hauled out from the hold, bumped over other bales, and swung and whirled against the steel hatch ways and dropped over onto a lighter or onto a dock. It is then picked up by a crane and loaded onto trucks or box cars and again unloaded onto the stock pile or into the mill.

A bale loses roughly a pound of pulp each time it is handled. The dry outside of the bale is the part from which this lost pulp is broken off. The result is unfortunate in its effect on the bales.

Now aside from the actual loss this causes it results in a further loss in the effect on the samples due to the dry end of the wedge being in part or wholly removed. The tests if made on such a bale would indicate the presence of 52.6 per cent of air dry pulp where 55.1 per cent had been actually present. Our experience showed that this was the case in shipments forwarded.

				58.89	
405	395.9	2.3%	58.91	58.27	.06%
405	383.	3.5%	57.85	58.48	.07%
404	381.3	5.6%	58.29	59.41	.19%
405	368.4	9.1%	59.25	59.32	.01%
400	370.	8.2%	57.73	57.54	.03% loss

The gain in air dry weight should exactly correspond with the loss in gross weight.

To Sum Up.

The system of sampling and testing should be explicitly detailed for the protection of the mill and the guidance of the tester . We recommend the Wedge System.

The proportion of bales to be taken should be stated more fully than hitherto has been done so that if there are several lots of pulp included in the shipment a proportional number shall be taken from each lot and the air dry weight of each lot estimated separately.

The provision that only intact bales of normal weight shall be taken for test shall be rigidly enforced.

The method of cutting the wedges and selecting the laps should be to cut them always to a template and to cut one wedge from the top lap of every fourth bale.

We should like to recommend for discussion the establishment of a bureau for settling disputes. The bureau to nominate their expert and pay him. The bureau to consist of three men, one nominated by Pulp and Paper Manufacturers, one by Paper buyers and the third to be selected by these two. This bureau to settle disputes regarding quality and test.

E. S. Coleman, C.A. (Eng.) who has just opened an ofifce as accountant at 232 St. James St. Montreal, is well known the pulp and paper industry, having been on the staff of the St.Maurice Paper Co., and has taken active part as a member of cost accounting committees of the Newsprint section of the C. P.&P.A. His clients in the pulp and paper industry can thus rest assured that work placed under his examination will have the advantage of first hand experience.

Mr. Coleman has our best good wishes.

MORE STARTLING FOREST FACTS.

(Continued from page 60)

tical purposes, just what the situation really is. All we need is to take the figures we now have and use a little intelligence.

The United States is cutting more than half of the entire amount of timber that is consumed in the whole world, and is using 95 per cent of this at home.

In the United States to-day there remain only 137, 000,000 acres of virgin timber, quite a proportion of which is in inaccessible locations and is of indifferent quality.

The cut-over and partly burned land amounts to some 250,000,000 acres making a total of only 387, 000,000 acres of forest and partly denuded land.

The loss by fire alone in the United States during the past five years amounts to over 56,000,000 acres, or more than 11,000,000 acres per year. This is from fire alone to which must be added the depletion from cutting, wind and insects, which means at least an additional annual shrinkage of 15,000,000 acres or a total destruction in the United States of not less than 26,000,000 acres per annum.

With regard to the loss from wind, the United States, in just one storm last January, lost from this cause some 7, 000,000,000 feet of timber, equal to 14, 000,000 cords, In addition to the damage by these gales, we have the continuous loss that is going on all the time in the woods from wind which, if it amounts to only three trees per acre, more than offsets any annual growth, and the harder our lands are cut, the greater this loss from wind will be.

Enormous Waste as Compared With Amount Actually Used.

The situation in Canada is equally alarming, for while our annual cut is very much less than in the United States, our standing supply is also very much smaller, and our destruction from fire, wind and bugs is proportionately larger. As a matter of fact, the entire supply remaining in Canada to-day would not last the United States over six and one-half years.. In British Columbia alone 665,000,000,000 feet of timber have been burned, while on the Transcontinental Railroad between La Tuque and Cochrane 20,000,000 cords have been destroyed by fire as against considerably less than 1,000,000 cords which have been cut and hauled out on the same railroad. This shows the enormous waste as compared with the amount that is actually cut.

When we consider all the above facts, it is ridiculous for anyone to suggest that some hardship might accrue to the farmer if he were to be deprived of an open market for his pulp wood in the United States. All I can say to this is that every day the farmer allows his wood to stand and grow he is making money very much faster than he possibly can by cutting it now, as it is increasing faster in value than anything else in which he can possibly invest; and I cannot urge the farmer too strongly to let his trees grow, even to the point of borrowing money if necessary. In addition, he must remember that every cord of wood he ships out of the country shortens the life of one of our greatest industries, namely, pulp, paper and lumber; and he is thereby destroying his home market for his produce by the premature closing down of our home industries through the exhaustion of their wood supply. Finally, by reducing the cut one- half, which would produce a shortage rather than a surplus, as at present, the farmer's income would be just as large because the price of wood would automatically double and, instead of practically giving his stumpage away which he is doing at present, he would then be obtaining a fair stumpage return as well as an operating profit, and at the same time be conserving our timber supply. I am not cutting a tree on my own land and shall not do so while I remain in business, just so long as I can buy a cord of wood at any price.

In any event, the Government of a country must, of course always consider the greatest good to the greatest number; and when one figures the number of employees and dependents upon our great pulp and paper industry, as compared with the comparatively few who may be shippers of wood to a foreign country, who might be temporarily inconvenienced to their ultimate benefit, there can be no possible question as to what the Government's action should be.

Conserve Canadian Wood for Canadian Mills.

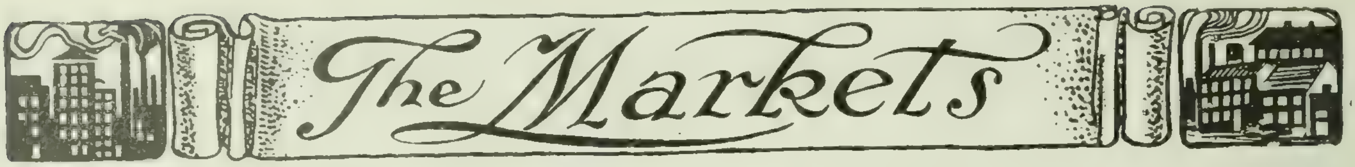
I am positive now that the whole truth is apparent that the urgency of the situation and the force of public opinion will compel the Government to take action to conserve Canadian wood for Canadian mills, and that in the future no Government can stand that does not provide adequate protection for Canadian wood-using industries. These industries are in a class by themselves, as every industry and every individual in Canada is dependent upon the preservation of our wood supply.

The subject of an embargo or export duty on pulp wood is not a question of what Canada might like to do. It is an absolute necessity for the protection of her own mills. It is a situation where she must retain what small wood supply she has left or close down prematurely one of her own most important industries in order to ship the wood out of the country to supply the mills of the United States. Therefore, any suggestion of retaliation by the United States is unthinkable and could not be seriously considered. It must not be forgotten that small as the supply of standing timber in the United States now is, it is still four times as large as the Canadian stand.

The wood supply is unlike any other commodity, as it takes from 50 to 150 years to raise a new crop of trees.

U. S. DEPARTMENT HONORS G. W. SISSON

Washington, D.C., Jan.20,—The paper industry has been again given governmental recognition in the naming of its well known representatives as a delegate to the national farm conference which will be held at Washington the week of January 23. George W. Sisson Jr., of Potsdam, N. Y., former president of the American Paper and Pulp Association has been asked to serve by Secretary Wallace of the Department of Agriculture, who is making up the list of those who are to attend. Mr. Sisson, in addition to his work in the manufacture of paper has long been deeply interested in dairying, and was a leader in the organization of the Jersey cattle breeders of the country. He was for several years president of the New York State Agricultural Society, and only a year ago was on the Pacific Coast to judge cattle in an important Oregon cattle exhibition.



The Markets

CANADIAN TRADE CONDITIONS.

Montreal, January, 24. — Taking a general survey of the paper trade, business may be said to be fairly satisfactory. In one two directions it is better than this. The trade caters to so many divergent needs that it is difficult, under present conditions, to make a definite statement which will cover every branch, while one section may be busy, another may be dull most men are looking forward to our upward movement in Canadian Commerce, which will of course benefit the paper industry, but it must be confessed that so far indications of this improvement are locking; in some classes of business the exports are not reassuring.

Notwithstanding this position, the sentiment is plainly of an optimistic character so far as paper is concerned, with a feeling that the market will not be long before it opens up in a stronger fashion. The jobbers report that trade is of fair volume in the aggregate, but that the transactions are mainly of a character for immediate needs. Prices are likely to remain steady, and those who are engaged in the trade hope that they will not see anything like a repetition of the fluctuations which happened in 1921, and which upset all calculations.

Book-papers continue to be in good, request, with prices maintained, while the market for fine papers remains satisfactory. Orders for boards are limited.

Chemical pulp is quiet, with prices maintained, and with the prospect of this condition being held, as the manufacturers are not include to make any concessions. The demands for ground wood is slow.

As Toronto Sees it.

There is apparent from more than one quarter a sentiment that whereas a year aga we all faced serious business depression, to-day we face, and we experiencing, gradually improving conditions. There is no phenomenal change and that is perhaps a more healthy at mosphere. An interesting condition is the great deficiency in building, especially in the case of drewllings. The gradual recession of prices from the peak in 1920 both in labor and material, should permit of much building being done this year, and this will affect, not only roofing and other papers actually used in buildings, but large quantities of all forms of wrappings for hardware and goods liable to breakage or disfigurement by soiling, not to mention indirect increased volume of stationery. If anything like the required amount of building be undertaken in 1922, it should prove very useful to all branches of paper making.

With groundwood being sold as low as $26. and sulphite near $65., coupled with the recent wage reduction decisio nby the board of arbitration in New York, whereby a cut of 20 p.c. affected 10,000 men, it is considered by some in this neighborhood that Newsprint may be expected to come down considerably below its present levels for new contracts.

Groundwood not much offering outside of contracts. Some transactions lately around $25. to $26. up to $30. for stored pulp. Better qualities and fresh ground stock have been reported as high as $40.

Sulphite, natural—Prices are $60.— $70. though not much at the lower figure. Some selling at $72. at mill.

Sulphite, bleached — $100. to $107.50 at mill.

Kraft— $50. to $55. is the price range.

Book and Writing— The market quiet is but signs of improvement are apparent in spite of usual quiet conditions pertaining to January.

Tags, Covers and Bristols — Very little change. Fair volume of orders. . .

Wrappings— Market steady.

Waste Paper — The market while showing very little advance in actual prices is much stronger in under tone, and reports come in from all parts of the country showing that the dealers have practically no stock on hand.

It is confidently felt that when mills do resume buying in something approaching normal tonnage prices will move much higher.

Market on cotton rag of all grades is practically nominal.

NEW YORK MARKETS.

New York, January 21—(Special Correspondence)—Quietness continues to prevail in the paper market. Business has not opened up in anything like the proportion that a good many members of the trade anticipated for about this time, and yet the fact that consumers are still operating as buyers in a limited way has caused no great amount of surprise because it is generally believed that demand will necessarily expand slowly owing to existing conditions throughout the paper consuming industries. At the same time, there is much confidence among paper men regarding the outlook. and it can be said that while the market locally is far from booming in activity, there is sufficient business current to give the situation a fairly lively complexion.

Newsprint is steady in price and is moving in a more or less regular way toward publishers, who evidently are gradually increasing their consumption of newsprint because of the growth in advertising. Reports that the German Government plans to restrict exportations of newsprint and wood pulp tend to have a reassuring effect on the newsprint market here, and domestic producers and dealers mostly feel that the bugaboo of tremendous print paper supplies from Germany for the United States will be rapidly dissipated. Figures compiled by the News Print Service Bureau show that production of news print in the United States and Canada during December was 7,984 tons or 5 per cent more than in November, and that stocks at all reporting mills on December 30 amounted to but four day's maximum production, which indicate that newsprint mills are operating on a gradually increased scale and are carring but light stocks of paper.

Book papers are quiet but there is more inquiry from consuming sources. Tissues are firm at the recent advance in price to about 90 cents per ream for No. 1 white tissue. Wrapping papers continue to enjoy a fairly good demand,and are unchanged in price. Fine papers appear to be improving in demand, and from all accounts, mills making bond and ledger papers find

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it necessary to increase their output day by day to take care of expanding demand. Box boards rule rather quiet though indications are not wanting the box manufacturers will soon resume buying in larger tonnage. Prices hold at between $37.50 and $40.00 per ton f. o. b. New York on plain chip board and $40 to $42.50 on news board.

GROUND WOOD—The market for mechanical wood pulp, while in a more or less stationary position, maintains its firm tone and prices rule steady. Domestic grinders are mostly obtaining in the vicinity of $32 per ton f. o. b. producing plants for prime spruce ground wood for prompt shipment, and importers quote this price up to several dollars a ton higher. There is scarcely enough demand to excite the market and cause any advance in prices, nevertheless reports invariably state that available supplies are light and opinion among those on the selling end of the trade is that any broadening of demand at all would serve to send quotations at least slightly higher.

CHEMICAL PULP The chemical wood pulp market lacks feature at the moment. Consumers are absorbing pulp in limited lots, and the great bulk of supply moving is against contracts which has little effect on the market situation, but quotations are well maintained and the trade mostly takes a confident view concerning the outlook. Bleached sulphite is selling at 5 to 5.25 cents a pound for No. 1 domestic, and from 4.50 cents upward for No. 1 foreign strong bleached. Kraft is steady and in good demand at 2.75 to 3 cents per pound.

RAGS — Further advancement in prices of roofing stock is the outstanding development of the week in papermaking rags. No. 1 roofing rags have sold to felt mills at 1.15 cents a pound f. o. b. New York and No. 2 packing at one cent a pound. Old whites seem to be strengthening in tone though prices remain about the same. New cuttings also are firmer with dealers expecting a better demand and therefore holding back supplies.

PAPER STOCK — The movement of old paper toward consuming mills is of fairly large volume and prices continue to incline upward, advances having been registered in several grades this week. Folded newspaper are now quoted to mills at 60 to 65 cents a hundred pounds f. o. b. New York, No. 1 mixed papers at 40 to 45 cents, old heavy books and magazines at 1.50 cents, No. 1 hard white shavings at 3.5 cents and No. 1 soft white shavings at 3.25 cents.

OLD ROPE AND BAGGING — Prices on old rope and bagging hold steady and there is no change of note reported in the markets for these grades of papermaking material.

UNITED STATES NOTES.

Percival Wilde and Walter S. Wyman, both of Augusta, Maine, have been appointed receivers for the Cushnoc Paper Company, pulp and paper manufacturers of Augusta. The company, which is said to have been operating since last July under supervision of a creditors' committee, is understood to have assets of $500,000 as against liabilities of $1,000,000.

Chemical Abstracts, the Technical Association of the Paper industry publication run in connection wth the Cellulose and Paper Section, has added to its staff as assistant editor, Mr. Clarence J. West, who is also chairman of the association's committee on bibliography.

According to a report given out by O. M. Potter, secretary of the Woodlands section of the American Paper and Pulp Association, the first year of the section's existence has resulted in the accomplishment of a great deal of telling work. The divison's membership is now nearly one hundred, with representatives from many of the leading pulp and paper companies of the United States.

A new line, to be known as "Standard Onion Skin", is being put on the market by the Kalamazoo Vegetable Parchment Company. The new product, which is being sold by C. A. Hubbard, formerly distributor and salesman for the Bryant Paper Company, promises to become as popular as the well-known "K. V. P." sulphite bond. Mr. Hubbard reports that he is doing a large and steadily increasing business.

Wilfrid Beauvais 25th January 1922

Plans for the marketing of a recent innovation in the line of paper products are being made by a new York City inventor who has devised a way of manufacturing a waterproof, emergency paper umbrella. The paper rain guard, it is claimed, can be used at least a half a dozen times. It is folded flat, and a big stock can be caried in a small space. The umbrella is to sell for twenty-five cents to the retail purchaser, and is to be handled in every large city through news stands, stationers, drug stores and dry goods stores.

What is said to be the first trainload of imported newsprint paper to go into the interior of the United States through a Pacific port, was shipped out of Astoria, Ore, last week for Spokane. The consignment of paper had previously been freighted from Norway via the Panama Canal.

Mr. A. St. C. Ryley, formerly General Sales Manager Trussed Concrete Steel Co. of Canada, Limited, succeeded Mr. Reynolds as Manager of the Montreal territory with ofices at 323 Drummond Building, 511 St. Catherine St., W. Montreal.

Scandinavian American Trading Co.

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Bismarck Brown R. conc.
Safranine B.S.
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Methylene Violet 2R. conc.
Methylene Violet 2B. conc.
Malachite Green Crystals.
Methylene Blue B.B. conc.
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NEWS BLUE

SUBSTANTIVE COLOURS

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Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.
Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
Paraphenine Yellow G.
Diazamine Fast Yellow H.
Rosophenine 10B.
Benzopurpurine 4B.
Paper Black 3181

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Orange IV.
Naphthol Blue Black 10B.
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British Trade News

(From Our London Correspondent.)

London, Jan. 11, 1922.

At the birthday luncheon given to Sir Frederick Becker on December 30 last, a characteristic cablegram was read from Mr. Hall Caine (Montreal). It ran: "Please convey to your guest and my friend and colleague my warmest congratulations on to-day's happy occasion. To be out here is to realise how far-reaching is the good name and reputation of Becker, and whether in New York, Montreal, or far up on the line of exploration in Northern Quebec, I hear nothing but respect and admiration for dear old Fred. My regret is great at my absence, but keep a place for me at your table. I am with you in spirit to do honour to the best of chiefs."

Successful Profit Sharing.

Notwithstanding diminished trade in 1921. The Watford Engineering Works Ltd., paper mill engineers, have distributed approximately 4 1-2 p.c., on the workers' wages for the second year's working of the firm's profit sharing scheme. This is a special side of industrial welfare which develops a greater interest in the success of the Watford Engineering Works, on the part of all employees, whose numerical strength has increased by 22-4 p.c. when compared with the previous twelve months. It is stated that the Directors of the Works are satisfied that the scheme has proved of great benefit all round and there is no doubt that 4 1-2 p.c.. on the wages earned by workers is a nice little gift.

Dull Paper Trade.

The Xmas and New Year holidays have interfered considerably with business in paper circles and at present there is a dullness prevailing. The poor home and foreign demand is felt keenly by most of the mills, some of which are closed down, or working on short-time, as the case may be, for an indefinite period. Optimistic as one may be, it must be admitted that dark clouds still overhang the industry and they will take a lot of lifting in the present competition of prices.

Determined efforts are now being made by the various Premiers to get the European markets on some sort of a footing, so as to get a "more on" in exports and in the interchange of business. Conferences in France are being held and so far they are proving somewhat successful. But as a counter-stroke rumors are prevailing in London about a general election, which, it is contented, will disorganise trade and industry to an unappreciable degree. Added to these elements are exposures of Russian tactics in England, which have not reached the expectations of manufacturers. One can see at a glance that the European questions still remain unsettled and in such difficult times it is hardly expected to give anything like a sensible outlook for the paper industry of England, Scotland, Wales, and the "Free State" of Ireland. If the rates of exchange were even stabilized there would be something to set trade going again.

Pulp Quotation Hardening.

In pulp circles business is on limited scale, which must be expected at this period of the year. Good shipments continue to arrive and for future business sellers have optimistic views, so much — owing to a reduction of mill stocks — that they have hardened quotations.

Prompt deliveeries of groundwood are quoted at £5 12s, 6d., and dry groundwood £11.. Bleached sulphite is £22, Easy Bleaching £16, newsprint quality £15; Unbleached Soda is £13. 10s. for No. 1; Soda Kraft £12. 10s. First quality Esparto is £6; No 1 Bona and Phillipeville can be had for £4 5s.

Norway's Trade in 1921.

It is easy to characterise trade and industry in Norway in 1921. The past year was a period of heavy stocks, small dealings, dear production, and unsettled conditions — an inevitable reaction after a period of golden prosperity when money poured into the country and fortunes came without much effort. According to the latest figures the export trade suffered materially in 1921 as the folloing returns show for January to Sept. 30, last:

	1920	1921
Printing Paper (tons . . .	108,062	45,168
Packing Paper (tons)	56,824	13,741
Timber (cubic metres) . . .	552,908	198,123
Wood Pulp tons)	330,093	202,975

The relatively high wages have not fended to help industry and have not decreased to the same extent as wholesale prices.Also several of the smaller banks have experienced difficulties, one or two important insurance companies have also met with trouble. Indications point to the fact that the worst is over and that the future may be looked forward to with hope.

Asociated Paper Mills, Ltd.

On the 1st January the half-yearly dividend on the preference shares of the Associated Paper Mills, Ltd., was due, but the Directors have decided to postpone payment until negotiations with the Inland Revenue authorities have been concluded and the auditors have completed the balance sheet. When these are completed the Directors say they will be in a position to advise the shareholders of their decision regarding the payment of the dividend; in any case it will not be postponed beyond the 30th June next. Here we have another instance of how Government taxation on a heavy scale has upset the affairs of a company. The Associated Paper Mills Ltd., are placed in such a position that they cannot even settle up a definite balance sheet. Many other companies are in a similar position.

Northcliffe's Admission.

Lord Northcliffe's speech to Australian newspaper men has just reached London and he said that reporters and sub-editors have none of the anxieties the proprietors have been through during the war. They are not worried about the price of paper, the increased cost of machinery, and the hundred and one other details. Today, he added, the tremendous expense of newspaper production is lessening the number of newspapers all over the world. People do not always think about that. On the other hand, the enormous development of newspapers is materially increasing the number engaged in the production of papers.

NEW THREE RIVERS MILL

Three Rivers, Que., Jan. 20.—The new newsprint mill of the International Paper Company, which is located at Three Rivers, will be started in February.

The initial production will be 100 tons a day and, if the market warrants it, the plant will be doubled, the output being at the rate of 60,000 tons a year.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. **GARDENVALE, P. Q., February 6, 1922.** **No. 6**

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J. NEWELL STEPHENSON, M. S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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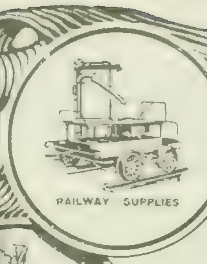

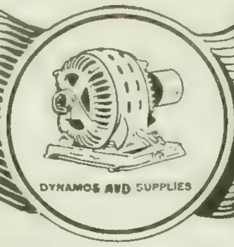

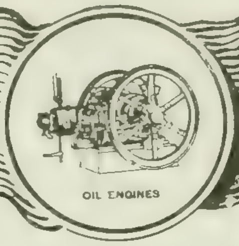

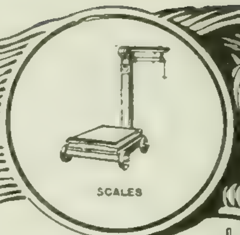

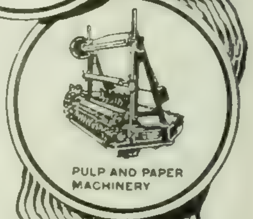

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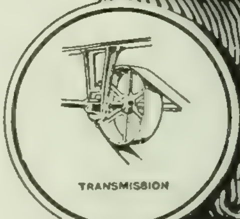

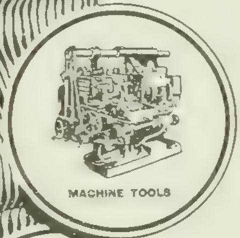

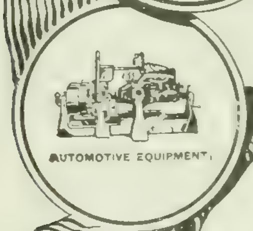

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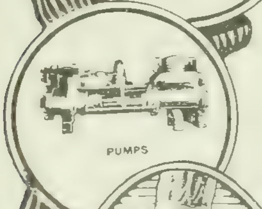

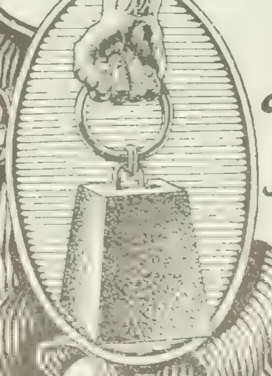

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EDITORIAL

THE BEST YET.

We feel quite sure that everyone who attended the 1922 Convention of the American Pulp and Paper Association, will agree that it was the best gathering in the history of the organization. The atmosphere was quite different however, from that which pervaded the gathering a year ago. At that time there was just beginning to be an intimation of business difficulties which it was confidently hoped might be avoided and which it was believed the Pulp and Paper Industry was in a good position to meet should they actually occur. Between that time and the meeting last week, industry the world over has been plunged into the depth of business depression such as has not been experienced in more than a generation. Having touched the bottom with a considerable bump, there is evidence on all sides that business is now on the rebound and there was consequently a spirit of "conservative optimism" as R. S. Kellogg expresses it, which pervaded the meeting of this year.

The attendance was better than had been anticipated and it could hardly be said that the reason for this was that "Misery loves company" but rather that those in charge of the management of the Canadian mills, having fully appreciated the numerous advantages of sticking together for mutual assistance, encouragement and even in some cases, sympathy during the strenuous times of the past year, wanted to get together and with the sunshine once more breaking through the clouds of business depression, make plans for a better cooperation and wider service through the coming year.

The discussions at most of the meetings, particular-

MR. GEORGE McKEE,
President of the Canadian Pulp and Paper Association

ly of the Technical Section and of the Woodlands Section, were without question the best that we have ever had. Some of the papers called forth a wealth of comment and additional information which was most encouraging and helpful. On the other hand, some papers were read and applauded without being followed by the questions and comment that the subjects should have excited. It seems too, that some of the matters discussed in the general meeting of the association might have been given a little more consideration by those attending the meeting.

The speeches at the association luncheon and banquet were fully up to the high standard which has been enjoyed in times passed. The messages of Honorable Honoré Mercier and Mr. Robson Black on Forestry Conditions and Regulations were most timely and the emphasis laid by them on this subject should be appreciated by all Pulp and Paper men in the Dominion. We were particularly struck with Mr. Mercier's question as to why Canadian mills use stumpage bought from the Crown thereby diminishing their future supplies and at the same time permitted settlers' wood, cut almost in their back yards, to be sold to their competitors elsewhere. It seemed that the attention given the speakers at the banquet was considerably better than was the case a year ago but it must be admitted that there is still room for improvement by those who sit at tables under the gallery and apparently forget they are in the same room with many people who prefer to hear the addresses of the evening than to be disturbed with private conversations.

The association is to be congratulated in its choice of officers for the coming year, not only for the character and ability of the men elected but also because this is the only time that any Pulp and Paper Association anywhere has had the distinction of being led by an Indian chief. Donnacona — alias George McKee – chief of the Mohawks of the Iroquois nation, is president and Mr. H. F. E. Kent is Vice-President. The former is manager of the Donnacona Paper Co., which manufactures newsprint and the latter is president of the Kinleith Paper Mills, manufacturers of high grade book and writing papers. The Pulp and Paper Magazine wishes to place its services in any capacity at the disposal of the new officers.

A pleasant feature of the meeting was the presentation of a handsome watch to Mr. A. L. Dawe in appreciation of the untiring and highly efficient services that he rendered the association during the five years of his connection with it.

VIRTUE IN SPENDING.

There has been a great deal said and written during the last year of the virtue of saving and to a certain extent we feel that this is partly responsible for the period of depression through which we have been passing and particularly for the extent of unemployment at the present time. It may be a comfort to have a big bank account or to have a lot of high grade stocks and bonds tucked away in a safe but that situation must be considerably regretted if one stops to contemplate the men of character and ability who are vainly seeking a chance to earn enough to buy their daily bread.

Men and women are out of work because the general public has stopped buying the products of their labor. This disinclination to buy is no doubt partly due to excessive wages asked by certain classes of labor and the excessive profits demanded by certain groups of manufacturers and employers, reflected and passed on in many cases by the retailer to the public. At the present time however, the prices of most commodities have been brought nearer to actual values than has been the case for several years and where a person can get his money's worth and has need of an article or can make profitable use of material, equipment, or personal services, we believe that the general welfare will be best served by buying to the limit of one's ability. In this way, a movement of goods will be induced which will almost immediately extend the opportunities for employment and will call for more raw material; the wages paid for the labor required to produce the extra goods purchased will immediately go back into circulation in paying for land, clothing, food, etc., and will in turn make for more work in all lines of business.

A certain amount of saving is provident and advantageous but entire suspension of purchasing is neither in the interests of the public nor the individual when considered in the broadest sense. It seems therefore, that judicious spending, particularly at the present time, is much more of a virtue than penurious saving.

The University of Toronto is desirous of obtaining a copy of the Pulp and Paper Magazine for July 3rd, 1919. Anyone possessing an extra copy and willing to dispose of it will confer a favor on the University by communicating with the editor.

The Howard Smith Paper Mills, Ltd., 138 McGill Street, Montreal, also desires a copy of the December 12th, 1920, issue of the Pulp and Paper Magazine, which we trust some reader will be able to supply.

What promises to be one of the biggest gatherings of representative paper men ever held at Kalamazoo has been arranged for June 2nd and 3d when the Michigan book paper center will be entertaining the Superintendents' Association of the American Pulp and Paper industry, the Technical Association of the Pulp and Paper industry, and the Cost Association of the Paper industry, all three organizations having made tentative plans to hold their annual meetings this year at about the same time at Kalamazoo. This gathering of paper mill men will come close to rivalling in importance the annual convention of the American Paper and Pulp Association which usually meets in New York City.

Powdered Coal as Fuel in Steam Plants

By HENRY KREISINGER, Research Engineer, and
JOHN BLIZARD, Fuel Engineer, U. S. Bureau
of Mines.

It is now definitely established by experiment that a higher thermal efficiency can be obtained in steam plants by burning coal in powdered form than by burning it by any other method. It can be said also that in many steam plants, steam can be made more cheaply with powdered coal than when burning coal by any other method.

The reasons for the high thermal efficiency of powdered coal are as follows:

(1) Very nearly complete combustion can be obtained with small excess of air.

(2) Variation in load over a wide range can be readily followed, and at the same time furnace conditions giving high efficiency can be maintained continuously and easily.

(3) No coal need be burned on banked boilers during the low load periods.

It is apparent that the first two of the above conditions of high efficiency depend entirely on proper burner and furnace design. In other words, it is the furnace that makes high efficiency possible. No matter how cheaply or how easily powdered coal is prepared, if the coal cannot be burned efficiently, the plant is a failure. For this reason a large part of this paper is devoted to furnace design.

Very Nearly Complete Combustion With Low Excess of Air.

Very nearly complete combustion with low excess of air is the first requisite of high thermal efficiency. Numerous tests show that with powdered coal, combustion complete within one per cent can be obtained with 20 per cent excess air. This one per cent of incomplete combustion includes both the gaseous combustible as CO in the flue gases, and the unburned carbon in the ashes.

TABLE 1

SUMMARY OF RESULTS OF THREE GROUPS OF TESTS

ON A 468 B.H.P. EDGE MOOR BOILER BURNING POWDERED COAL

ONEIDA STREET POWER STATION

THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY.

1. Condition of coal	Dried	Undried	Coarse
2. Number of tests averaged	5	3	2
3. Average duration of tests, hours	23.26	21.16	24.38
4. Moisture in coal as burned, per cent	2.75	8.05	3.53
5. Coal through 200-mesh, per cent	71.3	70.8	64.7
6. Coal through 100-mesh, per cent	94.72	94.90	89.7
7. Rating, per cent	117.0	112.8	113.4
8. Carbon dioxide, per cent by volume	15.1	15.6	14.85
9. Oxygen, per cent by volume	3.5	3.2	3.85
10. Carbon monoxide, per cent by volume	0.02	0.0	0.05
11. Temperature of flue gases, deg. Fah.	484	488	478
12. Per cent of excess air	21	18	22
13. Incomplete combustion loss, per cent	0.8	0.3	0.8
14. Boiler efficiency based on gross calorific value of coal, per cent	82.2	80.8	82.2
15. Boiler efficiency based on net calorific value of coal, per cent	85.3	83.9	85.3

Table 1 gives the averages of the principal results of three groups of tests made at the Oneida Street Station of the Milwaukee Electric Railway and Light Company. The first vertical column gives the averages of a group of five tests made with dried coal; the second column gives the averages of three tests made with undried coal; and the third column the averages of two tests made with coarse coal. Each test lasted 24 hours. The tests were made on a three pass Edgemoor boiler rated at 468 boiler horsepower, and equipped with a Lopulco furnace designed by the Locomotive Pulverized Fuel Company. The furnace is shown in Figure 1. During this series of tests a thorough study was made of the combustion of pulverized coal and the proper design of furnaces for burning pulverized coal. Figure 2 shows a group of isothermal lines determined by measurements

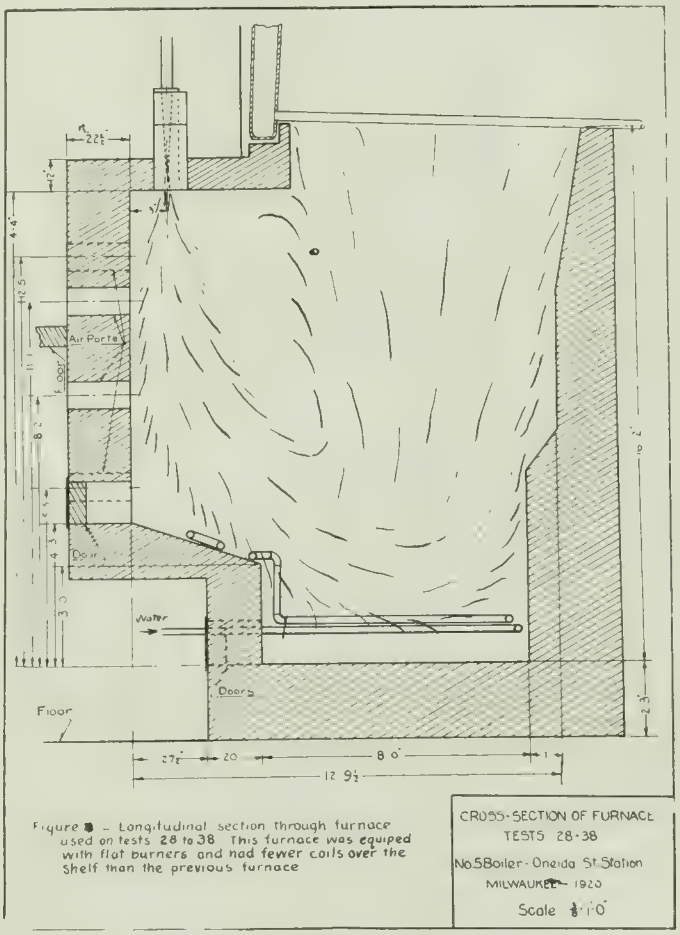

22½
12
4-4
5½
12 5
Air Ports
Door
11 1
8 2
4 5
4 3
3 0
Door
Water
Doors
Floor
16 2
2 3
27½
20
8 0
1
12 9½
Figure ■ - Longitudinal section through furnace used on tests 28 to 38 This furnace was equiped with flat burners and had fewer coils over the Shelf than the previous furnace
CROSS-SECTION OF FURNACE
TESTS 28-38
No.5 Boiler - Oneida St. Station
MILWAUKEE - 1920
Scale ⅛"-1'-0"

Figure 1.—Section through furnace of the Oneida Street Station of the Milwaukee Electric Railway and Light Company. The tests, results of which are given in Table I, were made with this furnace. The coils shown near the bottom is an experimental water screen from which the screen shown in Figure 4 was developed. This furnace was recently rebuilt on similar design of the furnace shown in Figure 4.

---

* Paper read at the annual meeting of the Technical Section, Canadian Pulp and Paper Association, Ritz Carlton Hotel, Montreal, Jan. 25 & 26, 1922.

with platinum thermocouples. The highest temperature is shown to be a short distance above the shelf, where the combustion is most intense, due to violent mixing of the gases and particles of coal caused by the change in the direction of the flow, and where the flame thus far in its path from the burner has been unable to radiate a large proportion of its heat to either the cooling coil beneath it or the lower row of tubes above it.

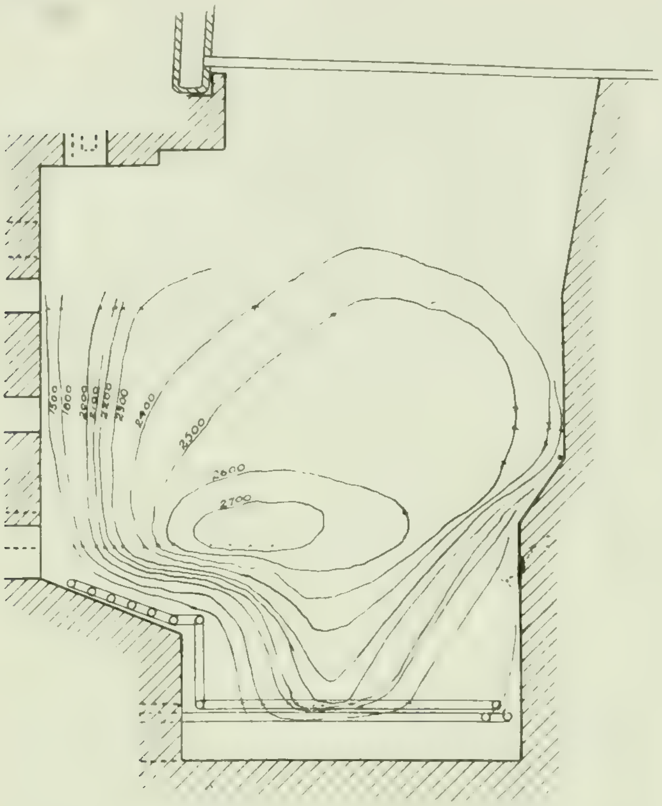


Figure 2. — Isothermal lines in furnace shown in Figure 1. The temperatures were determined by platinum thermocouples. The highest temperature is shown to be a short distance above the shelf where the gases mix with air, where the combustion is most intense. This high intensity of combustion is due to violent mixing of the gases and particles of coal caused by the change of direction in their path of travel.

By referring to items 12 and 13 it will be seen that the excess of air averaged 21, 18 and 22 per cent, and the incomplete combustion loss averaged 0.8, 0.3 and 0.8 per cent for the three groups of tests. The overall thermal efficiency of the boiler was 82.2, 80.8 and 82.2 per cent based on gross heat value of coal, and 85.3, 83.9 and 85.3 per cent based on net heat value of coal.

Figure 3 shows graphically the results of another series of 26 tests made at the Lakeside Station of The Milwaukee Electric Railway and Light Company. All of these tests were made on the same four pass Edgemoor boiler rated at 1,338 boiler horsepower and were of 24 hours duration. The results are plotted on the percentage of rating as abscissae. When two or more tests were made at nearly the same rating, the results were averaged and the averages were used in the plotting. This series of tests covers a range of from 135 to 255 per cent of the boiler's rated capacity. The highest efficiency was obtained at about 150 per cent of rated capacity. Even when the rating was increased to 255 per cent, an efficiency of 82 per cent was still obtained. This efficiency, shown by the lowest efficiency curve in Figure 3, is based on the gross calorific value. The curve above it shows the efficiency based on the net calorific value, and is seen to be about 3.5 per cent higher. The curve at the top shows the overall thermal efficiency of the boiler and economizer based on the net calorific value, which for practically all the tests was well over 90 per cent, a very high efficiency.

It will be noted on the two curves of Figure 3, giving the excess air and the incomplete combustion, that in this series of tests the excess air was as low as 5 per cent. The incomplete combustion heat loss did not exceed 2.4 per cent; it is plotted on the same scale as the thermal efficiency and is shown by comparison to be extremely small.

Complete combustion with low excess air is ordinarily accompanied by high furnace temperature, and high furnace temperature destroys the furnace lining, and causes the ash to fuse on the bottom of the furnace, whence it is difficult to remove.

We have then the following chain of reasoning:—

On account of the cost of preparation, powdered coal must be burned with high efficiency in order to compete successfully with other methods of burning coal. High efficiency is obtained by burning the coal completely with low excess of air. Low excess of air causes high furnace temperature which in turn is destructive to the furnace lining and makes removal of refuse difficult. Therefore, the success of pulverized coal under steam boilers depends on the solution of these two problems:

(a) Prevention of the destruction of the furnace lining, and

(b) Easy removal of ash from the furnace.

The ash of most steam coal fuses and runs like molten iron at a temperature of 2,300 to 2,400 deg. F. When the temperature of the furnace lining exceeds that of the

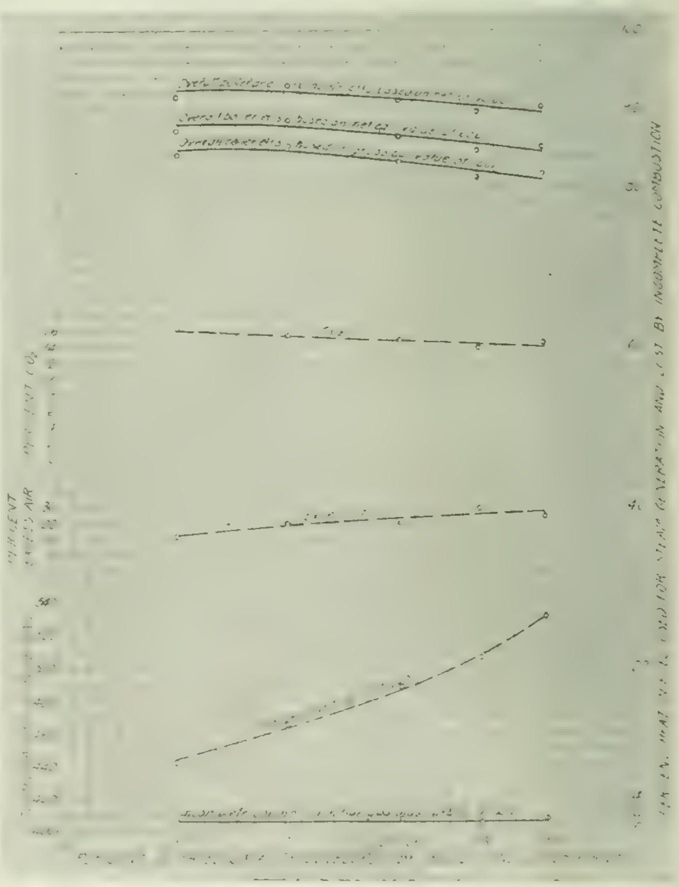


Figure 3.— — Principal results of 26 tests made at the Lakeside Station of The Milwaukee Electric Railway and Light Company. These tests were made on the furnace and boiler shown in Figure 4.

molten ash, the slag penetrates into the brick and washes it away. But if the temperature of the furnace lining be kept below that of the running ash, the slag on falling on the surface of the furnace lining is cooled to the temperature of the lining and becomes very viscous paste. In this vicious state the ash does not penetrate into the brick and does not wash away, but forms a soft protective coating. To prevent this erosion of brick work by slag, the furnace lining must therefore be kept below the temperature of running ash.

If the ash is to be removed easily from the furnace, the falling particles of the molten ash must be cooled and solidified before they reach the bottom of the furnace, and the bottom itself must be kept below the temperature at which the ash is sticky. Under such conditions the ash deposited is in granular form and can be removed easily.

Figure 4, which shows a furnace designed to operate on these principles, is the furnace of the Lakeside plant of The Milwaukee Electric Railway and Light Company, and the one on which the tests, the results of which are shown in Figure 3, were made. Its design was developed co-operatively by the Research Department of the Combustion Engineering Corporation, the Engineering Staff of The Milwaukee Electric Railway and Light Company and the U. S. Bureau of Mines.

The furnace lining is 9 inches thick and is separated from the outside walls by air spaces 9 inches wide. About 65 per cent of the air needed for combustion passes through these air spaces, absorbs heat from the furnace lining and thus keeps it below the temperature of the running slag. The air enters through the openings in the rear wall of the furnace. It passes through the air channels in the two side walls, meets in the passages of the front wall, and enters the furnace through the front wall air openings. The heat is taken by the air out of the furnace lining where it is not wanted, and is put into the combustion space where it is wanted. The air is heated while passing through the hollow walls to an average temperature of about 450 deg. Fahrenheit, and thus keeps the temperature of the furnace lining below that of the running slag, and prevents the erosion of the brick.

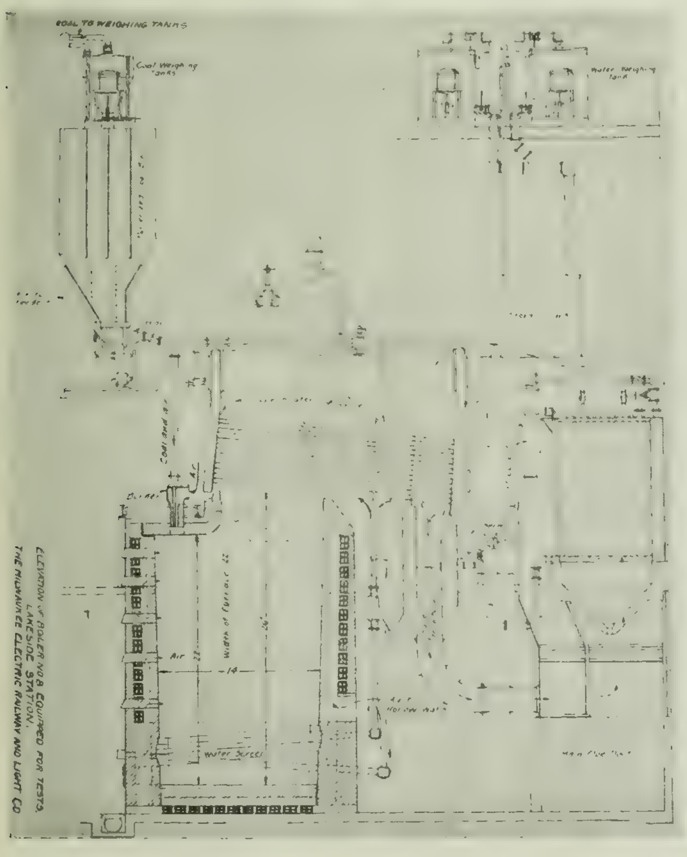


Figure 4. — Boiler No. 8 of the Lakeside Station of the Milwaukee Electric Raillway and Light Company. The boiler is shown equipped for tests the principal results of which are given in Figure 3. The furnace has a water screen connected to the boiler and hollow walls for supplying 65 per cent of the air used in combustion.

In addition to the benefits derived by cooling the furnace lining, the passage of air through the hollow walls greatly reduces the radiation losses by maintaining the outside surface of the furnace walls at a temperature not more than 15 deg. Fahrenheit above the temperature of the surrounding air.

The bottom of the furnace is kept cool by means of a water screen placed about three feet above the bottom. This screen consists of two rows of 4 inch tubes rolled into a common header in front. In the rear each row of tubes connects to a separate header placed at such an elevation that while both rows are inclined relatively to each other, each row is inclined to the horizontal at the same angle as the tubes in the boiler are inclined. This slope gives the water in the tubes a positive circulation. Water comes down from the rear water leg of the boiler into the lower row of tubes, passes through it to the front header of the screen, then enters the upper row of tubes and passes through it into the upper header in the rear of the furnace. From this header the water and steam rise into the boiler tubes over the fire and enter the front water leg of the boiler.

The water screen absorbs heat at the rate of 40,000 to 50,000 B.t.u. per square foot of heating surface per hour. In other words, it develops one boiler horsepower on less than a square foot of heating surface. The screens at the Lakeside plant have an effective heating surface of 300 square feet, and develop 400 boiler horsepower.

The effect of the screen in the furnace is threefold— (a) It absorbs from the flames by radiation an amount of heat equivalent to about 400 boiler horsepower, and therefore makes the furnace temperature considerably lower and helps to keep the temperature of the furnace lining below that of the running slag. (b) It cools and freezes the particles of the molten ash as they fall through it to the bottom of the furnace so that they are deposited in granular form. (c) It partly screens the bottom of the furnace from radiation from the flames, and also absorbs some heat from the bottom by radiation, thus keeping it below the temperature at which the ash is sticky. Thus it is possible with this design of furnace to maintain continually furnace conditions which give high efficiency.

Figure 5 shows the latest design of a burner for burning pulverized coal. This type of burner is installed in the Lakeside and Oneida Street Stations of The Milwaukee Electric Railway and Light Company. In these installations about 15 per cent of the air needed for combustion is supplied with the coal under a pressure of about 12 inches of water. About 15 to 20 per cent of the air is supplied through the burner around the nozzle, and 65 to 70 per cent through the hollow walls.

Variation in load can be readily followed.

With powdered coal the boiler operator easily controls the rate of combustion and air supply, and therefore the variation in the load over a wide range can be easily followed. The rate of combustion is directly proportional to the speed of the feeders and the coal burns as fast as it is fed to the furnace, which contains less than ten pounds of coal at any one time. About eighty

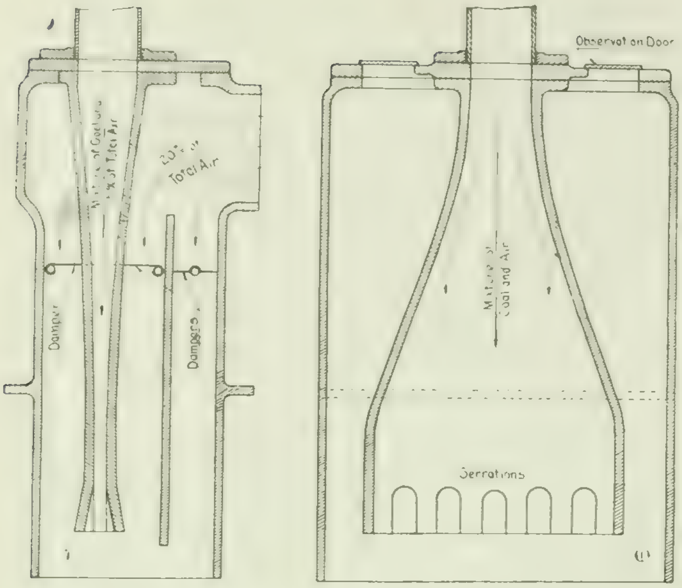


Figure 5.—Burner of the latest design installed on the new furnaces of the Oneida Street Station.

per cent of the air needed for combustion is supplied by the draft in the furnace, and the quantity required is controlled by simply regulating the draft. Figure 6 shows graphically how nearly constant furnace conditions can be maintained with a variable load. The figure gives the principal observations on a nine-day test made with two Stirling boilers burning powdered coal, at the plant of the St. Joseph Lead Company, Rivermines, Missouri. The tests were made under the actual operating load conditions. The regulation of the coal feed and the furnace draft was done by the regular plant fireman. There was also a battery of Heine boilers equipped with chain grate stokers in this plant. These stoker fired boilers carried a steady load while the two powdered coal Stirling boilers took the variation. The furnaces of the Stirling boilers are of somewhat older design and not having the water screen cannot be operated with as low excess air as the furnace shown in Figure 4. Nevertheless the efficiency was good. Table 2 gives the average of the principal results of the entire tests. The efficiency is expressed in two ways, one based on the high or gross heat value of the coal and the other on the low or net heat value. The efficiency of this test is the ratio of the heat absorbed by the boiler divided by the heat in the coal delivered to the feeders.

TABLE 2.

SUMMARY OF RESULTS OF A NINE-DAY TEST
ON TWO 768 B.H.P. STIRLINGS AT THE PLANT OF
THE ST. JOSEPH LEAD COMPANY,
RIVERMINES, MO.

	First 5 days of test	Last 4 days of test
1. Condition of coal	Dried	Undried
2. Average rating, per cent	155	156
3. Temperature of flue gases, deg. Fah.	562	567
4. Temperature of superheated steam, deg. Fah.	535	538
5. Per cent of carbon dioxide in flue gases	13.7	13.6
6. Per cent of excess air	32	32
7. Incomplete combustion loss, per cent	1.0	1.3
8. Boiler efficiency based on gross calorific value of coal, per cent	78.8	78.7
9. Boiler efficiency based on net calorific value of coal, per cent	81.9	81.8

No coal need be burned on banked boilers.

Powdered coal ignites with the same ease as gas. Therefore, fires under a banked boiler can be started and the boiler brought up to full operating conditions usually in less than ten minutes, which makes it unnecessary to burn any coal while boilers are banked. Thus powdered coal offers a possibility of considerable saving in plants where boilers have to be kept in a banked condition over long periods.

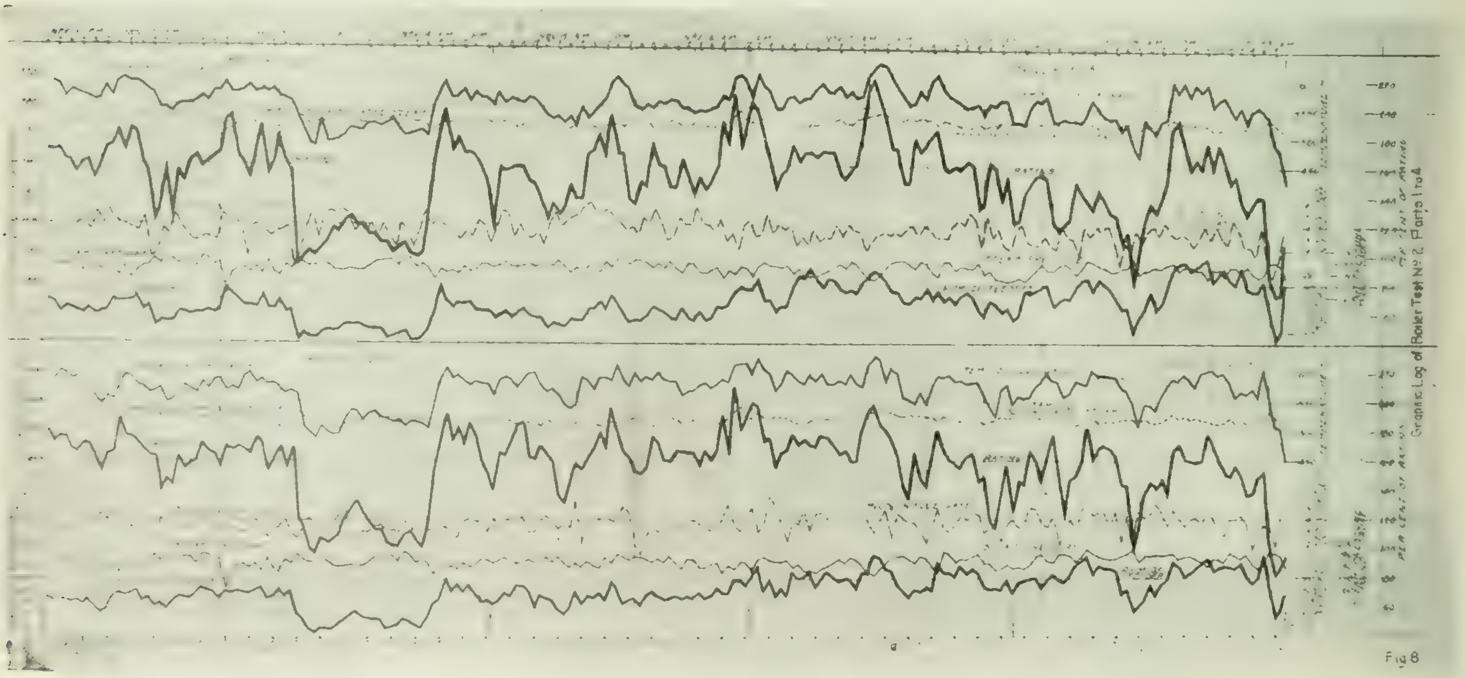


Figure 6.—Graphic log of principal data of a nine-day test on two Stirling boilers burning pulverized coal at the plant of the St. Joseph Lead Company, Rivermines, Mo. The chart shows how variation in load can be easily followed with good furnace conditions.

Power and Coal Required to Prepare Pulverized Coal.

In the present state of the art of preparation of pulverized coal, the power required to pulverize coal is about 14.5 kw. hours per ton when the coal is dried. This figure includes the power used to convey the coal from the pulverizing mill to the feeder bins. When the coal is dried in a dryer, the power required to operate the dryer is about 1.7 kw. hours per ton. In addition to this, about 1¼ per cent of the coal dried is burned to heat the dryer. If the coal does not contain too much surface moisture, it can be successfully pulverized without previously drying it, and the power required to pulverize the coal is about equal to the sum of the power needed to operate the dryer and the pulverizing mill with dried coal, or about 16.2 kw. hours per ton, but the coal that would be used in the drying process is saved.

In the past there has been a tendency to emphasize the necessity of drying the coal to a very low percentage of moisture and to pulverize it very finely. This necessity has been largely due to improper furnace and burner design and the inability of such furnaces to burn undried and coarsely pulverized coal.

Recently, however, with some coals the process of drying is being eliminated, and the coal is not pulverized so fine as was thought necessary in the past. This tendency, which has been made possible by better furnace and burner design is reducing the cost of preparation of powdered coal.

In this connection attention is again called to the results of tests given in Table 1. The second vertical column gives the average of three tests made with undried coal, and the third column the average of the results of the two tests with coarse coal. These two groups of tests show that as complete combustion was obtained with as low excess air with the coarse coal and the undried coal, as with the dried and more finely pulverized coal of the first group of tests.

It is the belief of the authors of this paper that the near future will see a greater reduction in the cost of preparation due to both the improvement in the pulverizing machinery and to the ability of furnaces to burn coarse and undried coal. The reduction in the cost of preparation will stimulate the use of powdered coal.

It may be pointed out in conclusion that the higher the price paid for coal and the lower the costs of electricity, the greater are the advantages to be derived from pulverizing coal before burning it. Pulp and paper manufacturers, situated as they commonly are, far from coal mines and near to water power, may therefore hope to derive more benefit from burning powdered coal than they who generate steam with cheaper coal, but whose electric power for preparing the coal costs considerably more.

Mr. B. L. Worden, formerly president of the Lackawanna Bridge Company, has been elected president of the Beaver Board Company under a reorganization plan providing for the under writing of about $3,000,000 of additional capital to permit readjustment of the company's debts without judicial proceedings. Two companies will be formed, one an asset company and the other similar to the present concern, a holding company. The asset company will own all of the plants and properties in the United States and the stock of the Canadian companies.

The people of Dalton, Mass. are planning to erect a suitable memorial for the late Senator W. Murray Crane. Senator Crane was one the Crane family which made paper making a big industry in the Berkshires.

Newsprint Service Bureau.

Despite adverse conditions the production of newsprint in Canada during the last year showed a decrease of only 8 per cent., compared with 1920, whereas during the same period in the United States there was a decrease of 19 per cent., according to a statistical review of 1921, read by Mr. R. S. Kellogg, secretary of the Newsprint Service Bureau, at the annual meeting of the Bureau in the vice-regal suite at the Ritz-Carlton Hotel Friday afternoon.

The greater duration of strikes in the United States, and the flooding of the American market with German and Scandinavian newsprint, were given as the principal reasons for the decrease in American production being greater than in Canadian production. The production in 1921 in Canada was slightly more than in 1919, while in the United States the output of newsprint was the smallest for ten years.

Total production in Canada during 1921 was 812,860 tons, as against 883,215 tons in 1920, a decrease of 8 per cent. Total production in the United States was 1,225,235 tons, as against 1,511,968 tons in 1920, a decrease of 19 per cent. Shipments in Canada for 1921 were 808,109 tons, as against 878,999 tons in 1921, a decrease of 8 per cent.; in the United States 1,226,064 tons, as against 1,502,574 tons, a decrease of 18 per cent. Stocks in Canada in 1921, were 13,986 tons, as against 11,117 tons, an increase of 26 per cent.; and in the United States 23,934, as against 24,763, a decrease of 3 per cent.

The consumption of newsprint in Canada and the United States was thoroughly analyzed by Mr. Kellogg, with the aid of graphic charts. The trend of advertising, circulations, and bulk of dailies and weeklies, as well as monthly and other periodicals, was also explained. "Newspaper advertising was exceptionally well maintained in 1921 and showed a total decrease of only 9 per cent, from the peak year of 1920 in 23 leading cities of the United States. Contrasted with this was the falling off of 38 per cent in periodical advertising," said Mr. Kellogg.

Outlook for 1922.

Advertising tendencies for 1922 were outlined by Mr. Kellogg as follows:—"The sustained volume of 1921 newspaper advertising was due to increaseed local advertising which largely offset decreases in national advertising. National advertising does not average over 25 percent of the total volume of newspaper advertising. Plans made for 1922 by national advertisers indicate a small increase over 1921 in magazine advertising, a considerable increase in newspaper advertising and a still greater increase in direct advertising".

Officers of the bureau of ensuing year were elected as follows:—President, C. A. Babcock, of the Wisconsin River Pulp and Paper Company, Neenah, Wis.; vice-president, Louis Bloch, of the Crown-Willamette Paper Company, San Francisco; secretary-treasurer, R. S. Kellogg, of New York; executive committee,, P. B. Wilson, Spanish River Pulp and Paper Company, Sault Ste. Marie; W. E. Haskell, International Paper Company, New York, and J. Leonard Apedaile, Price Brothers & Co., Quebec. A resolution of appreciation of the services rendered by P. T. Dodge, International Paper Company, New York, as president of the bureau for the last three years, was adopted by the meeting. Mr. P. B. Wilson presided.

Do good with what thou hast; or it will do thee no good.— ***William Penn.***

The Annual Meeting of the C. P. & P. A.

As the Canadian Pulp and Paper Association will issue a special bulletin containing the speeches at the Luncheon and Banquet, only a resume of the annual meeting will be given here, with some of the reports. All papers and discussions in connection with the Technical Section will be published in the Pulp and Paper Magazine, and reprinted later in book form.—Ed.

THE PRESIDENT'S ADDRESS.

By Percy B. Wilson.

In accordance with established custom it is the duty of the president, in calling our Association to order for this its ninth annual meeting, to direct your attention, briefly, to the outstanding features affecting our industry which have marked the year just closed.

From an operating and financial point of view the year has not been without its trials and its difficulties. In common with other industries we have had to pass through a period of readjustment which has challenged our utmost energies and keenest wisdom. A falling market and a decreasing demand for our products almost at the outset of the year found us with high-priced inventories, excessive labor costs, abnormal transportation charges and burdensome taxation to contend with. Liquidation of such of these items as it has been within our power to bring about has necessarily been slow and is still incomplete. As to the others, we have been powerless to secure the readjustment which the circumstances call for and which must follow before the industry is once more upon a firm foundation.

It is, perhaps, needless here to attempt to go into the various causes responsible for these changed conditions. They are referred to in detail in the reports of the Chairmen of the respective Sections. Principally they result from the universal depression in trade, aggravated, so far as our industry is concerned, by the undue advantages enjoyed by our competitors in Germany and other European countries on account of the depressed value of their currencies. It is pertinent here to mention, however, that a very considerable contributing cause of our present difficulties results from the attitude taken by the different price-fixing authorities in Canada and the United States which, from 1917 to 1920, undertook, under governmental authority, to regulate the conditions under which we were permited to carry on our business. The fact demonstrates once more the fallacy of arbitrary interference with the recognized and established laws of trade.

In regard to the future, our industry may be said at least to be no worse off than any other. We are engaged in producing a staple commodity upon which business and industry generally are largely dependent. The outlook is distinctly better than for the period from which we are now emerging. As an Association, as well as an industry, we can look forward with confidence if not with optimism.

Referring more particularly to the progress made during the past year and to the present status of our Association, it is gratifying to be able to record, in the first instance, that the Association has been of much assistancee in helping the members through the difficult and hazardous times we have all experienced. Its membership continues loyal. Its activities have been as manyand and beneficial as in other years.

Special mention should be accorded to the Technical Section, whose usefulness to the industry and the Association is constantly growing. The members would be well advised to give the report of the Chairman of this Section careful consideration. As he points out, it is in times such as those through which we are passing that the Technical branch of our industry must undergo the acid test and prove its worth. If, by increasing the efficiency of the mill and evoking economies in manufacturing methods without sacrificing quality, it can reduce the cost of production it will have done something towards counteracting the effects of a falling market and to justify its existence. Attention is also directed to the suggestion for an improved apprenticeship system and action to give it due effect is recommended.

The Vocational Education Committee which is operating in conjunction with the Technical Association has continued its work throughout the year and will come before you with a report of its accomplishments and a request for further funds to enable it to carry on its task. This is a work which we cannot allow to lag and one whose value will become more apparent as time goes on.

The growth and development of the Technical branch of the Association is such as to warrant us in looking forward to the time when it will necessitate a secretary of its own to devote his attention exclusively to its affairs. This is a subject which should come under the consideration of the Executive Council at an early date.

The Woodlands Section is also to be congratulated upon its work during the year. The principal function of this Section, that of studying ways and means for conserving and replenishing our pulpwood resources, is one of the most important before the Association or, for that matter, before the Dominion. Any effort put forth in that direction merits our warmest support and commendation.

The progress of the Committee on Scientific and Technical Research has been held up by the failure of Parliament to pass the Act providing for the establishment of a National Institute of Research in which the Association is so greatly interested. The Act containing the necessary provision was, it will be recalled, passed by the House, but failed of passage by the Senate. It is probable that it will be reintroduced at the coming session with, it is hoped, more favorable results. It should be the duty of the Association to do everything possible to bring about the final passage of the measure. .

Among the matters that have engaged the attention of the Executive during the year was that of the Australian Tariff on Paper. The new Australian Tariff Law, which became effective last year, imposes an import duty amounting to £3 per ton upon newsprint and of 15 per cent ad valorem on other grades of paper, but admits newsprint from the United Kingdom duty free and other grades of paper on payment of a duty of 5 per cent ad valorem. The effect of this discrimination against Canada, which is placed on the same footing as Germany and other countries outside the Empire, will, unless alleviated, be to exclude Canadian paper from the Australian market.

Numerous representations on the subject have been made by our Executive to the Canadian Government and there is reason to believe that action looking to an amelioration of the situation may shortly be forthcoming.

A notable event of the year was the visit of our representative to Sweden, Norway; Finland and other European countries in quest of information on forestry methods and administration. It is gratifying to be able to report that he was most cordially received in all the countries visited and was given every facility for conducting his investigations. The knowledge he acquired has been passed on to the members and to the public in general and will, it is believed, prove effective in helping our authorities to shape a rational forest policy for Canada and in spurring our own people into greater activity on behalf of forest conservation and reforestation.

In this connection, it is a pleasure to state that we have enjoyed fraternal visits from a number of eminent leaders of the Scandinavian pulp and paper industry, bent upon reciprocal missions, during the year. We particularly mention those of Mr. Thorsten Lungren, managing director of the Swedish Cellulose Association, and of Mr. John Poulson, managing director of the Norwegian Cellulose Manufacturers' Association, whose visits permitted a direct exchange of information and ideas, helpful, it is believed, to the interests of all concerned.

Our Publicity Department has continued its satisfactory work and has overlooked no opportunity to present to the public the best interests of our industry. Two special advertising campaigns have been undertaken on behalf of the Book and Writing Section which cannot help but to bear good fruit. An exhaustive investigation has been made into the question of whether or not the increased use of newsprint can be promoted by the use of advertising and a plan has been evolved having that end in view. Its adoption is still under advisement.

The Traffic Bureau has been transferred from Toronto, where it was operated in conjunction with the Canadian Manufacturers' Association Headquarters, to our own offices in Montreal. Some question has arisen as to the advisability of continuing this feature of the Association's work. A plebiscite of the members has been taken and awaits the action of the incoming executive. The Traffic Bureau's annual report is included among those distributed at this meeting and should have the careful study of all the members.

In connection with the Traffic question it may be well to point out that the present high freight rates on pulp and other paper-making materials are such as to prove a serious detriment to our industry. In comparison with the trans-Atlantic ocean rates enjoyed by our European competitors we are at a great disadvantage. A reasonable reduction in freight carrying charges would we believe start business moving and assist in solving the unemployment problem. It would create a market for wood products which cannot now readily be sold. This would bring work and wages, and the wages would buy many other commodities required by the workers. Canada is in a peculiar position of having so many raw materials from which to make money, and yet these raw materials suffer from high freight rates much more than do the average refined or manufactured materials on which the freight charges are so small that, in many instances, they affect the price little or not at all. The question of railroad wages is, of course, to be taken into account, but if we could get the traffic through lower rates, we would be on the way to better times.

The Association was most unfortunate during the year in losing the services of Mr. A. L. Dawe who, as secretary for a period of nearly five years, did so much towards bringing the Association to its present high state of efficiency and development. We owe a great deal to Mr. Dawe's capabilities, his enthusiasm for the Association and its work, his untiring patience and extreme affability in all his dealings with the members, as well as his never-failing willingness to sacrifice himself whenever necessary to meet the requirements of a sometimes, at least, onerous and difficult position. We find some compensation for his departure in the fact that he is still connected with the industry and because of that fact available for advice and assistance. I know that I but voice the view of every member in wishing Mr. Dawe the utmost success in his new undertaking, in recording our regret at his leaving us and our sincere thanks for his good work on behalf of the Association.

As a successor to Mr. .Dawe, the Executive has chosen Mr. Edward Beck, who has been Mr. Dawe's associate in the work for the past four years and who, as manager of the Publicity Department, is generally and favorably known to the members at large. The appointment is one upon which the Association is to be congratulated when it is recalled that Mr. Beck was connected with the Association throughout the whole of the difficult period when it was under government control and thus acquired a knowledge of its affairs that it would be difficult to impart to one who had not been "through the fire". His experience should prove of the utmost value to the Association and its members in the future.

In conclusion, I desire to express my gratitude to the members, and particularly to the Executive Council and the staff, for their unswerving loyalty and support during the year. In times like the present, when everyone's energies are more or less concentrated on his individual problems, there may be a temptation to minimize or overlook the advantages of association in trade organizations such as our own. This in my opinion, would be a great mistake. In times of stress, if ever, mutual confidence and mutual co-operation are essential. Instead of drawing away from our Association, or ignoring its calls upon us, we should rally to its support and make it serve the purposes for which no other agency is so well adapted and no other can so readily accomplish. In the United States, trade associations similar to our's, are now engaged in fighting for their right to exist, owing to a recent interpretation placed by the Supreme Court of that country upon a law originally designated merely to restrain interference with legitimate competition. As one of our trade associates on the other side of the border has pointed out in defense of the organizations thus assailed, "a properly and a legally operated trade association is pretty nearly fundamental to satisfactory development in our industries. There is every reason why manufacturers should get together to discuss common problems, and there is no reason why they can't do it in a legal way. There are, too, no reasons why manufacturers should fail to work together wherever they can do it legally and for the general advancement of their industry." It is true that the Federal Trade Commission has practically absolved our sister Association across the line from the ban in question and that, happily, in Canada, our right to organize and carry on for our mutual good on proper lines is not and is not likely to be open to question, but if it were under attack here as it now is in the States the chances are that we should be much more concerned in rallying to its defence and much less indifferent to its continuance. As it is, we should be willing to give our associations all the support necessary to their efficient maintenance and growth.

In closing I wish to bespeak your hearty support for and willing co-operation with the incoming administration and to express the fervent hope that the ensuing year will be the best and most successful in the history of the Association.

(Reports of Sections will follow in an early issue.)

ELECTION OF OFFICERS.

The following were elected as officers of the Canadian Pulp and Paper Association for the coming year: President, George M. McKee, general manager of the Donnacona Paper Company; vice-president, H. F. E. Kent, vice-president of the Kinleith Paper Mills; secretary-treasurer, Edward Beck.

Continuous progress and successful effort in face of increasing difficulties were noted in the reports submitted by the Newsprint, Chemical Pulp, Mechanical Pulp, Book and Writing Paper, Board, Wrapping paper, Felt, Coated Paper, and Traffic Sections.

THE LUNCHEON.

The Ball Room of the Ritz Carlton Hotel was the scene last Friday of the most interesting event in the history of the Canadian Pulp and Paper Association.

Mr. George M. McKee, newly-elected president of the association, was received into the Mohawk tribe of the Iroquois nation as Chief Donnacona. Ten Indian chiefs from Caughnawaga, headed by Grand Chief Two Axe, invaded the luncheon room in full war paint and feathers. Two Axe, by the medium of an interpreter, announced that it had come to the notice of the tribe that Mr. McKee had done great honor to a chief of the nation by naming the pulp and paper mill of his company near Quebec after an Iroquois who holds a unique place in Canada's history. Donnacona had been a great chief among the Iroquois, and it was a compliment to the red men that a great industry that found its life in the forest should bear his name. Not only had Mr. McKee named his mill Donnacona, but he had also named his company so, and on the incorporation of the town had suggested the same name. The spirit of the Donnacona of long ago had spoken to the tribe and had directed that the white man should be made a chief. Mr. McKee was then declared direct successor to Donnacona, after which the new chief was presented with a headdress of feathers and a blanket. The ceremony concluded with the smoking of the pipe of peace.

Mr. Mercier Sounds a Warning.

Complete reforestation of waste timberlands in the not distant future was predicted by Hon. Honoré Mercier, Minister of Lands and Forests for Quebec. The hope was further expressed that beginning next year the department would be able at least to plant a tree for every tree that is cut.

"There is no doubt that the time has come to make a good start in the reforestation of our timberlands," said Mr. Mercier. "We have over seven million acres of waste lands belonging to private individuals and to the Government. We intend to begin this important work very soon and we expect that the private forest owners will not hesitate to do their share. Next Spring, we shall enlarge the nursery at Berthierville, so as to bring its capacity to at least ten million trees per annum. We hope to be able to plant in this province every year at least a tree for every one that will be cut, so as to improve our forest wealth and remedy the losses suffered in the past by fires, bad lumbering, poor settlement and other causes. Legislation will also be introduced to encourage individual effort. I am glad to have the opportunity of commending the work done by such companies as the Laurentide Company, which maintains a large nursery near Grand'Mere and has experimented extensively in various plantations. We hope that others will follow suit, as this problem requires the co-operation of everyone".

The Minister sounded a note of warning to companies which politic running waters by allowing mill waste to run into rivers without first being treated to neutralize harmful ingredients. "This is a matter of major importance to the community. Pure water is one of the Creator's best gifts to man. Private interests, even those of great industrial undertakings of vast acknowledged benefit to the province, cannot be allowed to pollute public waters, endanger human and animal life and destroy our wealth of fish. In other countries it has been distinctly held that this condition of affairs cannot be tolerated, and I do not think it is too much to say that a similar stand must be insisted on here; and that mill waste must be properly treated before being permitted to escape into our rivers and lakes. I am convinced that with a due share of good will and regard for the general welfare of the public, some means can be found of complying, without compulsion, with the necessary requirements of the law in this matter, as well as in the construction of the necessary fishways in all dams."

After emphasizing the necessity of forest protection, Mr. Mercier reviewed the expansion of the pulp and paper industry under the Gouin administration. "The foundation of the industry was laid by enacting careful regulations governing the control of waterpowers, the cutting of timber, the protection of forests from fire, reforestation, and to ensure the manufacture in Canada of timber cut in the province on Crown lands by making such manufacture a condition of the lease of timber limits. The result is seen in the fact that we have today over 30 pulp and paper factories, representing an investment of 100 million dollars and having an annual output of over 60 million dollars. And yet, this is but a commencement. Notwithstanding a recent temporary setback, Quebec confidently believes that it is destined to become the most important centre in the world for the manufacture of pulp and paper. It can hardly be otherwise. We have the raw material in abundance; we have expert manual labor in this kind of work; we have numerous and well-situated rivers for the floating of logs, and with considerable waterpowers we have electric power in profusion. And as a guarantee for the capitalist who risks his fortune in such enterprises, we have the inestimable advantage of being free from socialistic agitations and of having a population which is a respecter of peace, of order, and of property."

Another note of warning could be discerned in this pronouncement: "It is contended in some quarters that our policy prohibiting the export from Canada of our raw material for pulp and paper is to some extent nullified by the fact that considerable quantities of it are shipped into other provinces and thence finds its way into the United States. The suggestion has been made to the Government that legislation may become necessary to prevent this roundabout way of evading existing laws and regulations. I am not ready to say what steps may be taken to meet this state of affairs, but something must surely be done.

Following Mr. Mercier, Mr. Robson Black, secretary and manager of the Canadian Forestry Association, packed a lot of good hard facts into a very brief speech which was delivered very effectively. He outlined the great service that this association is rendering the country by arousing in the mind of the ordinary citizen a realization of his stake in the forest and an appreciation of his responsibility in maintaining this property in a productive condition.

THE BANQUET.

One of the very enjoyable features of the annual meeting was the banquet held on Friday evening. An unexpectedly large number were present and to say there was plenty of enthusiasm and good spirits is not any exaggeration. A number of very good musical selections were enjoyed while dinner was being served and the speakers were men of national reputation. A new custom was inaugurated by the executive at this affair by having the retiring president act as toast master. Mr. Percy Wilson handled the ceremonies with his usual grace.

The first speaker was the Hon. James A. Robb, Minister of Trade and Commerce for the Dominion of Canada who responded to the toast "Our Country". Mr. Robb mentioned the importance of export trade to the welfare of the Dominion and the important place which is held by the Pulp and Paper Industry as a typical Canadian enterprise. The speaker called for the cooperation of the leaders of industry in helping his department render the greatest possible service to the citizens of this country.

Major,the Rev. Cannon Shatford of Montreal spoke of "Our Times" and made a very effective speech interspersed with a number of humorous stories.

The last speaker was Prof. B.K. Sandwell of the McGill Faculty who represented the Press owing to the inability of Senator Smeaton White to attend. Mr. Sandwell wisely addressed himself to the "adjacent tables" and referred to the Press as the best customer of the members of the Association.

THE TECHNICAL SECTION.

The sessions of the Technical Section occupied both Wednesday and Thursday and gave an opportunity for hearing and discussing a number of interesting paprs and important reports. A fixture in the Technical Section program is the annual smoker and when one stops to consider the happy informal way in which managers, superintendents and technical men all meet and enjoy themselves on this occasion, one finds the solution for the great success of the Canadian Technical Section and the good fellowship and the feeling of being personally acquainted which permeates the whole organization of the Paper Industry in Canada. Personally knowing the Technical men in this way makes for an appreciation of their efforts which is a very important factor in the effective work that the Technical men are doing. Not only do the the Technical men in other plants; thus the whole in- the heads of their own company, but make the acquaintance of the heads of other companies and with the Technical men in other plants thus the whole industry is like one big family with an annual family dinner and good time.

The papers and discussions of the Technical Section are being printed in full beginning with the January 19th number of the Pulp and Paper Magazine. This, together with the reports of committees and discussions will appear in book form as transactions and meetings of the Technical Section in the Year Book.

Probably the most important feature of the meeting was the extensive consideration given to the matter of Education. The report of the Text Book Committee showed that Volume 3 covering the Manufacture of Pulp in the five volume series on the Manufacture of Pulp and Paper is now on the press and will be ready for distribution within a month. It was found that an additional appropriation would be necessary to complete the work yet to be done on Volumes 4 and 5 and the recommendation for an additional $5,000 grant by the Association was passed and at the subsequent meeting of the Canadian Pulp and Paper Association there was no objection made to the motion. With the raising of a similar addition of the amount over the original estimate by the American Paper Industry , a total of $40,000 will have been subscribed for the preparation of these text books.

HON. JAMES A. ROBB,
Minister of Trade and Commerce.

A committee was appointed to consider a proposal for the carrying on of the Educational work by cooperation with the educational authorities and the paper mills in establishing local extension classes and schools and, if necessary, conduct appropriate correspondence courses. Messrs. Neilson, Campbell, Mitchell, Mason and Crossley were appointed to look into the matter and as a result of their recommendation approved by the Technical Section a committee on Apprenticeship and Education will be appointed by the incoming officers.

A very pleasant feature of the gathering was the presentation to winners of the Technical Section's Essay Contest of the prizes. The recipients were W. C. Munro, D. E. Reid and F. W. Bradshaw. Mr. George Carruthers, Chairman of the Technical Section presented the prizes in his usual happy manner.

The Nomination Committee brought in suggestions for the officers for 1922 and as no further nominations were offered by the members present, the nominations of the committee were approved, as follows:

Chairman, Mr. O. F. Bryant, Laurentide Co., Vice-president, Mr.. R. W. Hovey, Abitibi Power and Paper Co., Executive Council, Mr. Maurice Neilson, Belgian Industrial Co., Mr. C. Nelson Gain, Don Valley Paper Co., Mr. George Carruthers, Interlake Tissue Mills Co.

The Woodlands Section.

The Woodlands Section held their annual meeting at the Windsor Hotel at the same time that the Technical Section was in session. It is felt that in future it will be advisable to have a program so arranged that the meetings will not overlap. A number of very important subjects were discussed which will be more fully published in later numbers of the Pulp and Paper Magazine. A feature of the Forestry meetings was the presence of the Exhibition car at the Grand Trunk Station. The reports and discussions show that great interest is being taken in forestry work and that progress is being made in this important factor of the Pulp and Paper Industry.

U. S. NEWSPRINT PRODUCTION.

American newsprint production for 1921 totalled 1,225,235 tons, 10 per cent. below production in 1920, and 12 per cent. less than the average output in the 1918-19-20 years. December, 1921, output of 107,877 tons showed an increase over November production of 3,273 tons, but was nearly 14 per cent. less than the December, 1920, production of 124,857 tons, says the Boston News Bureau.

Last month's output shows a big comeback from May, when the papermen's strike closed a great many mills and output was but 78,868 tons. Production is still restricted, as labor troubles have not entirely been eliminated. During December last, mill stocks increased about 4 per cent., shipments being that much less than production.

Bulk of newsprint imports come from Canada with Sweden now leading the European countries.

The weighted average price of contract deliveries from domestic mills to publishers during December 1921, f.o.b. mill, was $82.04 per ton, but, due to further reduction by leading producers to $70 a ton. January average will be substantially lower. The average price reached its peak last January with a price of $121.58, so that within the year it fell 32½ per cent.

The following table shows production for December and 12 months in the past two years, and amounts on hand at close of the year:

	1921.	1920.
Dec. production	107,877	124,857
12 months' do	1,225,235	1,511,968
On hand Dec 31	23,934	24,763

EXPORTS GAINED ALMOST A MILLION.

Canadian pulp and paper exports in December 1921 were valued at $10,325,533 as compared with $14,612,083 in December 1920, a decline of $4,286,550, and with $9,441,850 in the preceding month, a gain of $883,683. Increases in volume are shown in newsprint and all four classes of pulp over last year, despite decreased values.

Exports of newsprint for the month amounted to 1,453,195 cwts., valued at $5,708,178, compared with 1,300,431 cwts., valued at $7,369,631 in December 1920, a gain of 152,764 cwts. in volume and a loss of $1,661,453 in value. They exceeded November shipments by 112,097 cwts. in volume and $368,820 in value.

Exports of woodpulp of all descriptions during December amounted to 1,692,044 cwts., valued at $4,209,383, as compared with 1,343,451 cwts., valued at $5,974,869 in December 1920, a gain of 348,593 cwts. in volume and a loss of $1,764,486 in value. Compared with the preceding month, woodpulp exports gained 134,908 cwts in volume and $1,501,491 in value.

Exports of pulpwood for the month amounted to 46,379 cords; valued at $480,160, compared with 172,024 cords, valued at $2,621,081 in December 1920 and with 49,476 cords, valued at $614,974 the preceding month.

Comparative details for December follow:

December 1921.

Paper	Cwts	Value.
Book paper	1,307	$ 12,561
Newsprint..	1,453,195	5,708,178
Other paper		395,411
Total		$6,116,150
Woodpulp		
Sulphate	240,833	744,774
Sulphite Bleached ..	307,428	1,260,028
Sulphite Unbleached.	392,990	1,092,464
Groundwood..	750,793	1,112,117
Total	1,692,044	4,209,383

December 1920

Paper	Cwts.	Value
Book paper	4,394	$ 60,098
Newsprint..	1,300,431	7,369,631
Other paper		1,207,485
Total		$8,637,214
Woodpulp		
Sulphate	146,254	826,458
Sulphite bleached ..	163,809	1,282,206
Sulphite unbleached..	361,234	1,939,813
Groundwood	672,154	1,926,392
Total	1,343,451	$5,974,869

Countries of destination were: Paper — United Kingdom, $80,521; United States, $5,347,662; other countries $687,967.

Woodpulp United Kingdom, $612,219; United States, $3,224,713; other countries, $372,451.

Comparative figures for the first nine months of the current fiscal year show:

	Paper	Pulp	Total
1921	$51,096,335	$26,808,940	$77,905,275
1920	67,688,697	65,227,302	132,915,999
1919	44,198,106	30,226,806	74,424,912

Exports of pulpwood to the United States for the nine months were 564,446 cords, valued at $7,229,593.

Pumps and their Characteristics

By E. F. DOTY.

(Continued from issue Jan. 12.)

Description, etc., of The Indicator.

Before proceeding to describe other types than steam pumps, we should explain the indicator, an instrument which is connected to one or both ends of the steam cylinder by means of tapped openings.

By using the indicator the engineer can determine the steam pressure at all points in the stroke of the engine and the mean effective pressure (M.E.P.) from which the actual indicated horse power (I.H.P.), of the engine is determined.

The instrument consists of a cylindrical drum to which the chart paper is attached and held in place by clips; the drum is revolved by means of a cord, one end of which is attached to the drum and the other end is attached to the cross-head or other moving part of the machine under test. The drum carrying the paper thus revolves back and forth following the motion of the steam piston but on a much reduced scale.

The indicator is also equipped with a cylinder into which the steam from the engine cylinder is introduced through the threaded connection and stop cock which is placed between the engine cylinder and the indicator cylinder so that steam may be admitted to the indicator cylinder or shut off at will. The indicator cylinder is fitted with a piston which usually has an area of one-half of one square inch; this piston is held in position by a spring of tested and known strength and the steam pressure on the side of the indicator piston opposite to the spring compresses the spring which in turn is attached to a system of levers on which is mounted the pencil which registers the pressure within the engine cylinder as shown by the compression of the spring within the indicator cylinder.

A standard American Thompson indicator is shown by Figure 14.

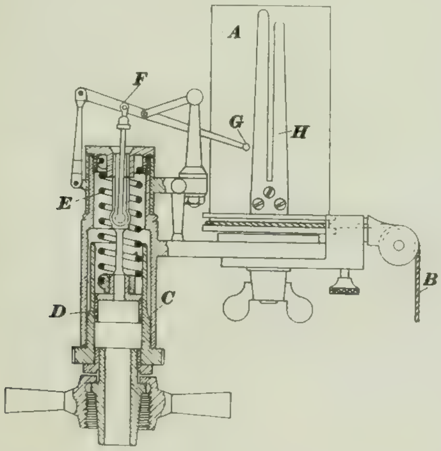


Fig. 14

Referring to these figures A is the drum which carries the paper on which the "indicator card" is registered and which is controlled by the connection of cord and hook B to the moving part of the engine. C is the indicator cylinder. D is the indicator piston, and E is the spring. F is the system of levers attached to the indicator piston which carries the registering pencil at G; H shows the clips on the drum which hold the paper in place while the diagram is being registered.

In order to calculate the (H.P.) it is necessary that the diameter of the steam piston and the length of stroke or travel of piston should be known or measured.

In the case of direct acting steam pumps whose nominal length of stroke is likely to vary it is desirable that the actual length of stroke should be measued at the same time that the indicator cards are taken. This will insure more accurate calculations for I.H.P. of direct acting steam pumps and can easily be measused by placing a rule opposite a point fixed on the piston rod between the steam and water cylinders and observing the length of travel; in the case of a duplex pump the travel of both sides should be measured.

In addition to his ability to determine the I.H.P. and M.E.P. of his machine the engineer can also show by means of the indicator card the drop in steam pressure between the boiler and the cylinder; leaking piston; leaking valve; improperly set valve; power demanded by full load; power wasted at light load; cost of running idle; loss of pressure resulting from improper piping between the boiler and engine and loss of power due to back pressure resulting from improper exhaust piping.

The indicator should be provided with suitable spring of the proper strength for registering the pressures to be dealt with at the plant and with several springs of different strength if different initial pressures are used or if cards are to be taken from high and low pressure cylinders of compound engines.

These springs are designed for and tested to pressures of various initial pressures used in regular practice.

The usual size of the diagram or indicator card is 2'' high and 4'' long and the springs are rated and marked to give a pressure per square inch according to their rating when the pencil arm is raised one inch; for instance, a spring which is stamped 50 makes a card one inch high for each 50 pounds of steam per square inch at the engine cylinder.

In order to make a proper selection of an indicator spring the operator should divide the boiler gauge pressure by 2, remembering that the indicator diagram will be approximately 2'' high, and in order to determine what steam pressure a spring is good for multiply the scale of spring, (or number stamped upon it), by 2 1-2, which gives sufficient margin of safety. From this product subtract 15 which represents the atmospheric pressure and the remainder represents the maximum initial pressure for which the spring should be used. This rule should never be exceeded.

Example:—What spring should be selected for an engine running under 100 pounds boiler pressure?

100 ÷ 2 = 50 = spring for a card 2'' high.

What is the maximum pressure that should be allowed for a No. 50 spring to work under?

50 x 2 1-2 = 125 – 15 = 110 pounds.

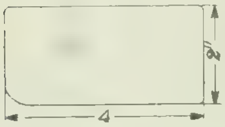
When the indicator cards are taken the following record should be made as a part of the testing data:—

Number, size and any other necessary information for identification of the machine being tested.

Cylinder diameter and length of stroke in inches; name and end of cylinder from which the indicator card is made, (such as high pressure, low pressure, right or left hand, head end or rod end).

Number of spring; number of revolutions or strokes per minute; gauge pressure at boiler; and reading of vacuum gauge if testing a condensing engine.

The direct acting steam pump which takes steam at or near full boiler pressure throughout its entire stroke will show an indicator card for each stroke as shown by Fig. 15.



Fif. 15

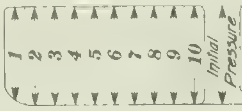


Fig. 16.

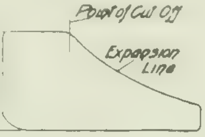


Fig. 17.

It will be noted that the diagram of pressure represents a rectangle which fills the card with the exception of a small rounded corner at the left hand side which shows the compression due to cushioning steam at the end of the stroke to prevent slamming as the steam piston works up close to the cylinder heads. A card showing the opposite stroke would have the lower right hand corner rounded in a similar way and when the engine is working properly both cards should be of similar shape; the one for the piston will be slightly smaller due to the diminished area of piston due to the piston rod.

The method of calculating the indicated horsepower (I.H.P.) after the card is taken is as follows:—

Divide the card into ten equal spaces vertically as shown by Fig. 16.

The distance from the lower line to the upper line of card is measured through the middle of each of these spaces. The length of these lines are added (in inches) and multiplied by the scale of spring used in indicator when making the card. This product is then divided by 10, (or the number of spaces used), and the product is the mean effective pressure, (M.E.P.) throughout the stroke of the steam cylinder.

The indicated horse power then is determined by the following formula:—

$$\frac{A \times PS \times MEP}{33000} = \text{I.H.P.}$$

In which:—

A = Area of steam piston in square inches.

PS = Piston Speed or travel in feet per minute.

MEP = Mean effective pressure determined from the indicator card.

33000 = Foot pounds represented by one horse power.

Example:—

We have a single cylinder direct acting pump with a steam piston 10'' diameter, from which an indicator card has been taken with a No. 40 spring. The pump has a stroke of 12'' and during the test it was running 60 strokes per minute.

The indicator card taken shows measurements taken vertically in the middle of the 10 spaces as described above which measure as follows:—

1 3-4''; 1 7-8; 2''; 2''; 2''; 2''; 2''; 2''; 2''; 1 7-8'' which added together equal 19 1-2'' or in decimals

$$\frac{19.50 \times 40}{10} = 78 \text{ pounds per square inch M.E.P.}$$

The area of the piston 10'' diameter = 78.5 square inches.

The piston speed or travel equals:—

$$\frac{12'' \times 60}{12} = 60 \text{ feet per minute.}$$

Then we have:—

$$\frac{78.5 \times 60 \times 78}{33000} \quad 11.1 \text{ Indicated Horse Power (I.H.P.).}$$

For close calculation of the I.H.P. the area of the piston rod should be deducted from the area of the piston before figuring the horse power for a steam cylinder having a rod passing through one head only, deduct one half the area of the rod from the area of the piston but if the rod passes through both heads of the cylinder deduct the entire area of the rod from the area of the piston.

Crank and flywheel pumping engines and some direct acting engines use steam expansively; that is, the steam is permitted to enter the engine cylinder at or near boiler pressure for only a part of the stoke, from the beginning of each stroke to a point varying up to approximately 3-4 of the full stroke depending upon the load to be carried the steam valve is then closed by its operating mechanism and the steam already within the cylinder must expand into larger volume and lower pressure as the piston moves towards the end of its stroke.

The use of steam expansively requires a radically different construction of the moving element outside of the steam cylinder and results in a greater economy of steam than when the steam is permitted to follow the piston at full boiler pressure throughout the entire length of the stroke.

The card taken from a steam cylinder with a cut-off is of very different appearance than those shown above and a conventional card from such an engine would appear like Fig. 17.

This card shows the result of the cut-off by the long upper curve called the "expansion line" it will be noticed that the pressure line is constant for about one-third of the entire length of the card, which means that boiler or initial pressure was admitted to the cylinder for one-third of the stroke when the steam valve closed and the steam already within the cylinder expanded during the balance of the stroke.

It will also be noticed that the rounded cushioning compression is shown at lower left hand corner as in the first card illustrated.

In calculating the M.E.P. from a card of this type precisely the same method should be used as in the former case, measuring the vertical distances midway between the spaces from the lower to the upper lines on the diagram.

The use of the indicator is urged on all operating engineers as the most effective and satisfactory method of knowing to a certainty just what a steam power or pumping engine is accomplishing and as a sure "X-ray diagnosis" for any troubles which are not evident from the outside of the machine. A careful study of the use and care of the indicator is advised, together with the clear and extensive instructions provided with the instrument.

There are several good standard works on the Indicator and the reader is recommended to consult one or more of these for a fuller description of the uses of this instrument.

(To be continued.)

The plant of the Kaministiqua Pulp and Paper Co. near Port Arthur, Ont. is offered for sale. This is equipped so to produce 40 tons of ground wood pulp daily.

Nothing can be of advantage to one that makes him break his word.

PULP AND PAPER NEWS

Encouraging news comes from the Engineering and Machine Works of Canada. Their plant at St. Catherines, Ont., is running full capacity, largely on grinders and other machine work for the pulp and paper industry.

To read the Broke Hustler one would think Iroquois Falls quite a metropolis. It really is not a very large town, but it is one of the most important communities in Northern Ontario. It does a lot for its size. A number of interesting events have happened there lately. We read that Mr. W. C. Ziemann has resigned his position as General Superintendent of the Abitibi Power and Paper Co. and was presented with a gold cigarette case and a gold watch by his coworkers at a banquet in his honor.

Another event of the Paper town was the big meeting of the Masons of the District on the 20th of January.

The spirit of the North was exemplified by the eight boys of the team and Principal Major Day of the Iroquois Falls School, who walked eight miles to play the hockey team at Monteith and won the match.

The Quebec Government has been waited on by a delegation from Chicoutimi, asking that a large storage dam be erected on Lake Kenogami. Premier Taschereau stated that the money needed was available, but contracts for the sale of power would be required before the work could be started.

In view of the fact that pulp and paper companies were the first to use aeroplanes for commercial purposes, a paper by Mr. R. H. Nislet, forester in charge of the aviation department of Price Bros. & Co., at the conference of the Quebec Forest Protective association on January 25, proved of great interest. Mr. Nislet gave details of the work done by Price Bros., and of the difficulties encountered. While the mosaic picture has certain advantages,Mr. Nislet had no aerial photographic maps as being of more general value and more easily interpreted. Many sweeping claims had been made for aeroplane work in Forestry, but aviation could stand on its merits without such exaggeration. The fact must be faced that flying is costly, but it can accomplish a large amount of work in a short time.

According to the annual reports of the forest protective associations, fires in the Province of Quebec last year were the worst for many years, some of them lasting for over two months. The cost to the St. Maurice Association was more than the total of the last ten years.

If the proposal of Mr. R.C. Kernan, of the Donnacona Paper Company is adopted by the Provincial Government, a permit system for entering timber limits leased by the Government will be enforced. Mr. Kernan's idea is that it will reduce fire losses. It was recognised that there is a certain amount of prejudice against such a system, and that legislation will be necessary. The subject was discussed at the meeting of the Quebec Forest Protective Association on January 25. Mr. Kernan dealt with the question in detail, and particularly from its legal aspect. The discussed various methods of issuing the permits and of making a system effective. In the course of the discussion Mr. Creesman described a plan used by the Wayagamack Pulp and Paper Company by which every man entering the limits received a brass check for which he paid 50 cts. returnable on giving up the check.

UNITED STATES NOTES.

A special tariff conference which is in session this week at Washington is being attended by twenty delegates representing the American Paper and Pulp Association. These include I. O. Van Duzer of the Louis De Jonge Company; Arthur C. Hastings of the Cliff Paper Company; O. M. Porter of the American Paper and Pulp Association, O. B. Towne, secretary of the Waxed Paper Manufacturers Association, and Dr. Hugh P. Baker of the American Paper and Pulp Association. Results of a ballot among the membership of the American Paper and Pulp Association show 103 in favor of the American valuation plan with but 7 against it.

Major W. S. McClelland of Eustis, Fla., president of the First State Bank of that city, has been chosen to head the Grass Fibre Pulp and Paper Corporation of Leesburg, Fla. His election was by unanimous vote at the first meeting of directors held recently at Leesburg. Major McClelland has taken great interest in the grass fibre plant. His experience in the ownership of a paper mill some years ago caused him to become very much interested in the possibilities of the new industry.

Col. Henry S. Graves, former chief forester of the United States, will return to Yale College as dean of the forestry school. Dean James. W. Toumey is to resume his more purely scientific work. Trustees of the estate of John W. Sterling will establish a Sterling professorship in forestry and Prof. Graves will be the first incumbent. Colonel Graves was the first dean of the Yale forestry school, assuming that office upon its foundation and resigning to accept the appointment as national forester in 1917. Dean Toumey has been connected with the school since 1900, and he took over its administration after Col. Graves resigned in 1917.

A net loss of $96,116 after expenses and taxes for the six months ended Nov. 26, 1921, is reported by the United Paper Board Company. In the corresponding period of 1920 a net profit of $1,002,985 was shown.

Two changes of more than usual interest to Kalamazoo Valley paper mill circles announced last week were the election of Charles A. Blaney as president of the Eddy Paper Company to succeed Oscar Gumbinsky, and the unexpected resignation of J. H. O'Connell from the King Division of the Allied Paper Mills where he has served most acceptably as superintendent since he was brought to Kalamazoo from the Miami Valley several years ago. Mr. Gumbinsky resigned from the Eddy Company because of a pressure of other business. Mr. Blaney's selection for the place vacated by Mr. Gumbinsky is meeting with general approval. Mr. O'Connell, who is president of the American Pulp and Paper Mill Superintendents Association, is being succeeded in the Allied Mills by Jacob Kuss, the superintendent of the coating division.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, January 31.—Practically no change is to be reported during the week. Business continues to be fairly good, so far as the general paper market is concerned, although some departments are more brisk than others. The first month of the year has not been satisfactory. All things considered, and if one may judge from the expressions of opinion contained in the reports of the sections submitted at the annual meeting of the Pulp and Paper Association, the remainder of the year would show an all round improvement. Apart from any increased demand, it seems clear that the industry must look for better financial results from a further decrease in working costs. These have been reduced to a considerable extent, but in some instances are still over 100 per cent higher than in pre-war days. In newsprint, for example,costs have not fallen in proportion to the drop in the price of paper. Many of the costs are not under the control of the members of the industry, but if these are even modified, there can be little doubt that the paper trade will be stimulated by reason of the lower prices which could be quoted, although in certain directions there is little or no margin for cheaper paper.

The pulp sections show little activity, with prospects for a little more liveliness in a short time. Book and fine papers are still in good demand, wrappings quiet; boards on the dull side; and waste paper firmer.

As Toronto Sees It.

RAGS AND WASTE PAPER.—Waste paper prices during the last week have shown considerable firmness, and prices on nearly all grades have advanced. From enquiries received by both American and Canadian mills indications show that a very few weeks will see a marked improvement in all prices as it is almost impossible to procure any large tonnages at the present time.

There have been a number of orders placed by mills consuming Roofing Rags. The prices quoted were from two to four dollars per ton more than ten days ago, and dealers are experiencing no difficulty in selling their output though the majority of packers are rather unwilling to sell ahead as they are only accepting business for spot delivery.

Dealers in paper makers supplies are feeling much more optimistic than they have for the past months, and are looking forward for a good Spring business.

NEW YORK MARKETS.

New York, January 28—(Special Correspondence)—Although reports indicate that demand for most kinds of paper is gradually broadening, the market as a whole continues comparatively slow and it cannot be said that business in paper is anywhere near what it is in busier times. Consumers are still buying in hand-to-mouth fashion, ordering today what they need tomorrow, or virtually on that basis, and while manufacturers are receiving a fair number of orders, the volume of buying is far under normal. It is but logical that under such conditions paper mills are obliged to curtail their operations. Current production in the aggregate is running at a fair percentage of full output, but there is no question that a majority of papermaking plants need more orders, and the fact that there is not enough business being placed to go around and satisfy everyone makes for a good deal of competition, which in turn is creative of a somewhat easy price undertone in a majority of grades of paper.

Newsprint mills, as a class, are probably running at a better rate of capacity at present than any other single group of paper producing plants in the United States. Consumption of print paper is holding up well and the low state of both mill and publishers' stocks makes it necessary that manufacturers keep their output at a fairly high level. Statistics just issued show that consumption of newsprint in the United States last year was within two per cent of the consumption of 1920, when, it will be recollected, probably more print paper was used by American publishers than ever in any one year before. Production in 1921, on the other hand, was only about 80 per cent of the previous year's output, the deficit being met to some extent by European importations but mostly from the stocks of consumers. Publishers' stocks on January 1, 1922, amounted to approximately 38 days' average consumption, which means that stocks of print paper in this country are at a low level. Figures of some 18 manufacturers for the first ten months of 1921 show a cost to produce newsprint of $69 per ton. This includes operation at peak wage scale up to May 1, with a 22 per cent cut thereafter. Recently manufacturers representing about 25 per cent of American and Canadian manufacturing capacity affected a second wage cut of about 20 per cent. With this cut in effect and wood written down to $20 a cord, the 18 mills above mentioned report a present cost of $62.50 per ton to produce newsprint. From every point of view, it can be seen by these figures that statistically newsprint is in a strong market position, and with domestic paper prices now down to a point where less competition from Europe can be expected, it certainly looks as though newsprint manufacturers in this country and Canada should continue to obtain increasing business and be favored with firm prices.

Book papers appear to be gradually working into an improved market position. Demand is still far from what it ought to be in point of volume but manufacturers generally report a pick-up in buying by publishers and printers and quotations on book papers are steadying. Wrappings are moving in relatively good amounts and prices are maintained. Tissues are stationary at the price advance announced around the first of the year and are in moderate demand although most of the present movement is against back orders from consumers and jobbers. Fine papers are steadier in price than in sometime and are meeting with a comparatively good demand. Boards are commencing to move better and prices are steady. Board mills near New York continue to quote about $40 a ton f. o. b. this city on plain chip and $42.50 to $45 on news board.

GROUND WOOD — A feature in the ground wood market in the States is the fairly large trade being conducted in Canadian ground wood brought to New York in schooners and shipped by rail from this port to consuming plants in New York State, Connecticut and other Eastern mill centres. Firm prices are being

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft Pulp mill in Finland except one, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

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obtained for this pulp, around $34 a ton f. o. b. New York being the prevailing market rate, and the manner in which newsprint, hanging and board mills are purchasing this ground wood from usual sources of supply. The mechanical pulp market displays a firm tone all around, and is moderately active. There is very little or no selling pressure and consumers are placing orders with a consistancy that gives the situation a very healthy complexion. Domestic ground wood quotations range from $32 to $36 per ton at grinding plants, depending on the distance between the produceing mill and the consuming point.

CHEMICAL PULP — Confirmation has been received by New York importers that Germany has placed restrictions on the exportation of wood pulp, and this has served to firm up quotations on foreign sulphite, particularly easy bleaching and Mitscherlich sulphite, a good part of the recent supplies of which has come from Germany. German Mitscherlich sulphite which only a few days ago sold to paper mills at less than 2.75 cents a pound ex dock New York, this week has readily commanded close to 3 cents, while most sellers of foreign easy bleaching sulphite now ask higher than 3 cents for such of this pulp as they have unsold on the spot in this country.

Pulp prices hold steady although current trading is rather of limited volume. Paper manufacturers are buying merely to cover direct requirements and can hardly be included to consider forward needs.

RAGS — Papermaking rags are moving toward mills in fair amounts and prices on most grades show an upward tendency. Roofing stock still leads in demands and No. 1 roofing is bringing around 1.15 cents a pound f. o. b. New York and No. 2 packing about one cent New York. Old whites are firming at a basic price of around 5.25 cents a pound for No. 1 repacked stock. New cuttings continue in slow demand but dealers are mostly holding supplies for a better market.

PAPER STOCK — Several grades of waste paper are in a decidedly strong price position, this being due partly to a scarcity of goods and partly to mill buying. No. 1 soft white shavings have strengthened to the point where packers as a rule want at least 3.25 cents per pound f. o. b. New York, while some quote a good deal above this figure. Heavy books and magazines are held for 1.60 cents New York, mixed books at 1.20 cents, old No. 1 kraft paper at 1.90 cents, and No. 1 hard white shavings at 3.90 to 4 cents. Folded newspapers are selling to board mills at 62½ to 65 cents a hundred pounds New York, and No. 1 mixed papers at 50 cents.

OLD ROPE AND BAGGING — After holding firm in price for a lengthy period, old rope has finally eased off about half a cent per pound, sales to paper mills at 4.50 cents a pound, and even slightly lower, at dealers' shipping points having been reported. Old bagging is dull and unchanged in price.

Mr. S. G. McCoubrey, formerly employed by the Abitibi Power and Paper Co. and at one time mayor of Iroquois Falls, has taken a position with the Wayagamack Pulp and Paper Co., at Three Rivers, Que. It is not a new place to him, but is somewhat changed since he helped install the first machines furnished by Bentley and Jackson. The Wayagamack mill is already the biggest plant in the world devoted to kraft pulp and paper, and will be even bigger when the two new paper machines are put in. Mr. McCoubrey likes to be associated with the big ones; he leaves the biggest news mill for the biggest kraft mill.

Mr. W. Gorman, of the Provincial Paper Mills, Limited, Montreal, is on a business trip to the Maritime Provinces.

GROWTH OF KRAFT PAPER INDUSTRY IN U.S.A.

The first kraft pulp mill on the American continent was established in Canada in 1908, with a capacity of 60 tons of 2,000 pounds daily. In 1922 the total rated capacity of thirty-six Canadian and United States mills will be 2,025 tons daily, and the increase through the twelve years since the first kraft mill was established has been evident every year. The gradual growth is shown by a table given in a bulletin of the American Paper and Pulp Association to its members.

The figures show that while Canada had the first kraft mill and maintained its lead in capacity for three years, the United States has since 1913 retained its leadership over its northern neighbour. The difference has at no time, however, been large, though the United States has apparently increased its capacity by building additional mills. The United States in 1922 will have 25 mills making 1,199 tons daily, while Canada's eleven mills can make 826 tons.

The production and importation of Kraft Pulp into the United States for the year 1920 was 285,000 tons. With a capacity of 1,200 tons daily, United States mills should be able to produce 300,000 tons annually operating only 250 days of the year, indicating that there is no real necessity for importation.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. **GARDENVALE, P.Q.,** February 9, 1922 **No. 6**

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:-: EDITORIAL :-:

MOVING THE FOREST PRODUCTS LABORATORIES.

There has been a rumor about for some time, that the Department of the Interior has been contemplating the removal of the Forest Products Laboratories of Canada from their present quarters in Montreal, to a new location at Ottawa. Correspondence with the Department confirms the rumor that this matter has been contemplated but no definite step has been taken as yet. The reason for, or the advantage in, making such a move was asked for but no information on that point has been forthcoming. We assume that there is neither.

From an occasional visit to the laboratories and a review of the work accomplished and that in progress, together with the problems pressing for solution, it seems perfectly clear that what is needed at the present time is a little more generous appropriation for staff in order to cope with the present situation rather than to spend money in moving to other quarters whose preparation for the work of the laboratories would be even more expensive.

Moving the Laboratories to Ottawa would be, in our mind, advantageous under only one circumstance; that is, the establishment of a Central Research Bureau which would include facilities for the investigation of the basic problems affecting Canada's important industries, particularly those founded on our unexcelled natural resources. Until such a central bureau is established and can supply facilities for investigations and immediate expert advice in pure science to those investigating industrial problems, it will be far better to leave the Laboratories in their present location where cooperation with one of Canada's leading Universities is not only possible but practicable.

There will come a time when certain departments of the Laboratories will require safe housing. The present structure, while attractive from the outside to one whose eye does not notice the considerable deviation of the walls from the vertical, and not inconveniently arranged inside, is becoming inadequate to the possibilities for service if better quarters were available. The building has been gradually sinking until it has really become unsafe and should be replaced. This building houses the Departments of Timber Physics and the general offices of the Laboratories but not the Pulp and Paper Division, which is accommodated in a separate building which is at present quite adequate to the needs of this department, there having been erected a few years ago, an addition designed to accommodate digesters and other pulp making equipment. The property belongs to McGill University and it will not be unreasonable to expect that the advantages of association with the Laboratories might induce the University faculty to provide out of their new building fund for better housing of their tenants.

The advantages of association with the University go far beyond the mere question of shelter. There are at the University a number of timber testing machines which are in very frequent use by the Laboratories staff and also used for instructional work by the University staff. Part of this equipment belongs to the Laboratories and is installed at the University for convenience and other parts belong to the University and are at the disposal of the Laboratories staff. This makes it possible to have practically double the equipment that either institution could afford by itself. Further than this, the personnel of both institutions are at hand for consultation and mutual assistance. This cooperation between the University and the Laboratories has apparently been more extensively developed with regard to the mechanical and physical properties of timbers than has been the case with regard to the utilization of wood in the manufacture of pulp and paper. It is in this direction that we are most interested although we fully appreciate the value of the work done by the other departments, such for instance, as measuring of fibres, the examination into the causes of and remedies for the growth of fungus and the preservation of timber for mill roofs.

We have felt that the Dominion of Canada as a whole, and those interested in the Pulp and Paper Industry in particular, have seriously suffered from the lack of co-ordination between the faculty of Applied Science at McGill and the pulp and paper division of the Laboratories. We fully appreciate the valuable work that has been done with the equipment and funds at the disposal of the limited staff of this branch for several years but we are certain that it would mean dollars to the people of Canada and more efficient operation of mills and more complete utilization of pulpwood if a director of exceptional ability could have been afforded by the Laboratories. Opportunities investigations in pulp and paper making and cellulose chemistry, together with the problem of the disposal or utilization of mill wastes, are almost unlimited. Many of these problems are not very urgent but there are many others which are pressing for immediate solution in order to prevent manufacturing losses, to eliminate wastes and to promote more efficient methods of manufacturing which would thus put Canadian industries in a position to compete more effectively with the industries in other countries where more attention has been paid to scientific developments.

Canada has no School of Pulp and Paper Making; Canada has not even a single University course in pulp and paper manufacture. McGill University and the University of Toronto include four lectures on this important industry in a series on Industrial Applications of Chemistry. This is good as far as it goes but it does not meet the situation. It is true that industrial development and the perfection of processes involving the natural sciences depends more on a thorough knowledge of fundamental scientific principles than on a superficial knowledge of some particular industry but it cannot be denied that a young man entering the pulp and paper industry as a career will give more satisfactory service and will be happier in his environment if he has had an opportunity of carrying out himself on a semi-commercial scale, the various operations of the pulp and paper mill. Such a practical laboratory work should of course, be based on an adequate course of lectures covering the entire industry. His mill work may be circumscribed. The students training should also include study and experience on the properties of cellulose. The class work and the experimental laboratory work would naturally be most efficiently done at the University but the practical operation of mill machinery and the control of manufacturing processes could not be better provided for than at the Forest Products Laboratories. The same man should be in charge of the work at both places. Such an arrangement would provide for the development of the best trained body of operating engineers who would be available anywhere during the near future. There is certainly no place on this continent where such combination of facilities is available and with the continuation of the plan of the Technical Section for placing University students in the mills for vacation work, there attaches a purposeful meaning to a University course which is of the greatest benefit to both the student and the mill.

It will be remarked that the first purpose of the Laboratories is the investigation of the problems associated with the utilization of timber and that the first duty of the University is to train the investigators who will attempt to solve these problems. What could be more logical or advantageous therefore, than to associate these two institutions and conduct the work of training and investigating in conjunction? At present we understand that the investigation of a problem as a basis for the writing of a thesis is not required for graduation in the department of Chemistry although we understand that essays are sometimes written on certain phases of industrial work. We believe that the young graduate will be far more useful to the industry he chooses to connect himself with if he could have some training in the organization and conduct of his attack on some industrial problem under the direction of a trained research man. We hardly see how a young man can otherwise obtain an appreciation of the factors involved in industrial operation nor the means of obtaining adequate, essential data with the least interference with mill operation. The very aquaintance he would get with measuring instruments and a bit of practice in cutting and fitting pipe would put the University man on an altogether different and better status with the mill man than he enjoys at present and his services will be worth far more to his employer.

It seems a shame that for so many years this opportunity of giving students some practical mill work and in the development of a course dealing particularly with Canada's most important manufacturing industry has been neglected. Under the direction of a qualified research man the work of investigation on many important problems could be organized in such a way as to collect the necessary data and at the same time give the students experience in the organization and interpretation of research work and the operation of pulp and paper mill equipment. Such an opportunity as the present close association between the University and the Laboratories offers would be entirely lost and without any compensating gain if the Laboratories were moved elsewhere. The idea of divided services is probably a bugaboo that has tended to scare the Forestry Branch from co-ordinating the work in both institutions under one man but there was a very successful precedent for such divided services in the experience of the first Superintendent of the Laboratories who at the same time was also editor of the Pulp and Paper Magazine and secretary of the Canadian Pulp and Paper Association. The work of the Laboratories is now too big for the superintendent to hold another position at the same time but the work in the Pulp and Paper division could not only be carried on simultaneously with teaching at the University, but such a combination would be a distinct advantage to both institutions and an unqualified advantage to the student and the industry with which he would later be connected.

No, Mr. Stewart, please don't move the Forest Products Laboratories of Canada to Ottawa or anywhere else until you have an institution as good as McGill to connect it with, but rather get together with the University faculty and work out some means for closer cooperation.

To try to make others comfortable is the only way to get comfortable ourselves, and that comes partly of not being able to think so much about ourselves when we are helping other people.

The world does not owe any man a living but every man owes the world a life.

Publishers' Announcement

The publishers of the Pulp and Paper Magazine take pleasure in announcing that they have been fortunate enough to secure the services of Mr. JOHN THOMAS HOYLE, as director of extension courses for the training and education of apprentices in all the industries served by the journals issued from the Garden City Press, Gardenvale, Que. They feel that this is an important step in the history of their organization and in its development along the lines they have planned.

Mr. Hoyle, who will enter on his duties at Gardenvale on the 1st of next month, is a Canadian. He was born, in Hamilton, Ont., and started his connection with the publishing business by serving as newscarrier and "devil" on the Hamilton Evening Times. He received his education at the Collegiate Institute, Hamilton; at McMaster University, Toronto; and at the University of Rochester, Rochester, N.Y.

Mr. John Thomas Hoyle

In all departments of the publishing business, whether editorial or mechanical, Mr. Hoyle has had a singularly ample and varied experience. At the present he is professor of Editorial Studies and head of the Department of Printing and Publishing at the College of Industries, Carnegie Institute of Technology, Pittsburgh, and is on the lecture staff of the Library School, Carnegie Library, Pittsburgh. Among the other positions which he has occupied may be mentioned those of Textbook writer and chief of the editorial department, International Correspondence Schools, Scranton, Pa., Manager Textbook Department, International Correspondence Schools, New York City; Department Editor, "The Grit", Williamsport, Pa; Managing Editor, "The Fra Magazine" and "The Philistine", East Aurora, N.Y.; Vice-President of the Roycrofters and literary advisor to Elbert Hubbard.

Among the works which Mr. Hoyle has edited are the following: "The Complete Writings (in fourteen volumes) of Elbert Hubbard; A Roycroft Anthology; In Memoriam; The Liberators; In the Spotlight; The Philosophy of Elbert Hubbard; The Four Minute Essays (in ten volumes) and The Crane Classics (in ten volumes) of Dr. Frank Crane; "Good Hardware", Aspinwall, Pa; and "The Winged Head", Pittsburgh.

Mr. Hoyle is the author of numerous articles in magazines and technical journals. He is also joint author of the Complete Advertising Course, International Correspondence Schools, and Standard Apprenticeship Courses, United Typothetae of America.

It will thus be seen that, in adding Mr. Hoyle to their organization, the publishers are adding one whose almost unique qualifications cannot fail to result in a great accretion of strength and efficiency to the entire organization in practically all its branches. His wide experience in the preparation of manuscript and in the artistic translation of manuscript into type will materially assist in the publishers' efforts to build up at Gardenvale a corps of copy producers, typesetters and pressmen second to none.

PULP AND PAPER READJUSTMENT NEARS END

Deflation in the pulp and paper industry has not been more drastic than in many other staples, but has been over-emphasized in the Canadian mind by the unprecedentedly large public interest in the securities of that industry. The basic physical elements which give the Canadian pulp and paper industry its strength are permanent, and are not in the least affected by temporary conditions, however extreme or uncomfortable. Meanwhile there are signs that readjustment in this industry, as in others, is in its final stages and may indeed be already complete in some departments. During the summer, bleached and easy-bleaching sulphite pulp were practically unsaleable. They are now in improved demand at improved and satisfactory prices. The summer low level was created by forced sales under pressure of curtailed credit, and cannot possibly be regarded as a permanency.

Readjustment in newsprint has been more gradual, but has already brought the price from a high of $130 to a present level of $70. This was brought about so gradually, and accompanied by so adequate a reduction in costs, that the loss to the newsprint companies and their security-holders has been not unduly large. If there is to be any further reduction from this level, it is safe to say that at this stage costs can be further reduced almost as rapidly and extensively, so as to preserve the margin of profit of the newsprint manufacturers nearly intact. At these prices, the representative Canadian newsprint companies can continue to earn substantial though not spectacular profits while many of their foreign competitors are operating at no better than cost.—Investment Items.

Think of good, useful and beautiful things, thereby toning up your mind to a high level, and improve every opportunity to uplift yourself.

"Famed is the name of the sculptor who can
Fashion mere earth to the pattern of man.
Greater is he who can shape shattered men
Into the form of the human again."

What it Costs to Build a Paper Mill*

By GUY TOMBS.

The lonesomeness of a large city coupled with the desire to make friends and enlarge his circle of acquaintances caused by Paul P. Harris, an attorney in Chicago, who occasionally lunched with thee other lonesome men, to start a club. The name "Rotary" was suggested because the meetings had been held "in rotation" at the places of business of the members.

The movement has extended until it has become an International body of 1073 clubs and 76,000 members throughout the Globe, and our own Montreal Club is nearly 9 years old and has 190 members.

Thus you see that in the first place, Rotarians are a select body, and pledged to high standards in business and professions with the ideal of *service* as the basis, and they are firm believers in the Golden Rule, their motto being "Service above Self", and a strict attendance rule keeps the member on his toes.

Now, one might ask "What do Rotarians do?" On the surface we meet here once a week, supposedly for lunch; but there is much more than this and, believing that on the welfare of the boy depends the future of the Nation, we take a very special interest in boys' work. In this connection this Club erected, furnished and maintains the John S. Lewis Cottage on the Boys' Farm at Shawbridge. We subscribed $28,000 to the Boys' Home of Montreal. The Club sends underprivileged boys away in summer to welfare camps. Interested in the "big brother" movement, each individual member has a "little brother" to look after throughout the year, culminating in one grand annual dinner.

Active committees are in charge of Boys' work, Education (we strive continuously, in public, in private, at the home and at school to advance the cause of proper education), Entertainment, Fraternal Inter-City relations, and Public Affairs.

But this is supposed to be a talk on Paper.

"What is this?" "An old newspaper", you say—incidentally a very good one, but the gathering of news and the news itself belongs to another story—merely an old newspaper, yet to provide only paper for for a big metropolitan daily means the clearing of 20,000 acres of Canadian timber lands per year, the employment of nearly 1,000 men in the woods, the support of a mill town of five thousand population as well as employment to distant coal and sulphur miners, machinery and chemical workers, the adjoining community and also the western farmer by buying his oats and flour, a trainload of freight daily, (about 3 tons come in for every ton of paper shipped out) support to a couple of branch banks and Canada's trade generally, large fees to the various governments and possibly a few cents to holders of paper stocks.

The first paper mill in the States was built near Philadelphia in 1690: the first mill in Canada was erected at St. Andrews East, near Lachute, in 1803, but the paper business as we know it, is comparatively modern. As you know, paper can be made from any vegetable fibre, also from silk and wool, but the great development of the paper industry and, of course, resultant cheap newspapers and books, was made possible by the pulping of the Spruce and other conifers.

We Are Living in the Paper Age.

In 1921 Canadian mills actually in operation were equipped to produce a total of 2,319,464 tons annually, divided as follows:

Woodpulp: Mechanical, 407,300; Sulphite, 469,096; Kraft, 148,400. Paper: Newsprint, 1,000,000; Fine, 58,228; Wrappings, 58,697; Boards, 137,678; Miscellaneous, 40,065.

We do not yet make in this country clothing, car wheels, etc., out of paper, nor convert the waste sulphite liquors into alcohol, as is done in Scandinavia, where the winter nights are long.

In 1921 our exports of paper were valued at about 75 millions and pulp about 30 millions—in the same period about a million cords of unmanufactured pulpwood went out of the country.

According to Government reports for 1920, in that year the total capital invested in Canada, mainly from without, was $347,553,333; number of mill employees, 31,298; wages paid $45,253,892. (These figures do not include the men in the bush). An industry that brings in 350 millions of capital, pays 45 millions yearly in wages, supplies our wants yet exports over 100 millions, provides the only means for the development of our vast hinterland and keeps our railways and ships going, I submit, is a great and permanent asset to this country, and it is to be hoped that Governments, publishers, labor unions, transportation companies and even stock brokers will realize this.

I suppose that last year the paper and pulp industry was the hardest hit and perhaps stood it the best—some mills closed, others ran 50 per cent or 75 per cent, but the paper mills are all averaging 88 per cent. now. When demands and prices were sky high, our paper mills, possibly actuated by Rotarian principles, neither fell down nor charged what the traffic would bear, but made their deliveries despite floating mines, lack of shipping, exorbitant freights, car shortage, blockades, congestions, and embargoes, leaving *nothing* undone to satisfy the customer as to price, quality and delivery, high wages and materials notwithstanding. For example, in 1920 one firm was obliged to ship 25 cars of paper by express and send eight solid freight trains to New York in order to keep their customers going, believing with us that "He profits most who serves best."

Conditions changed, demands and prices fell, contracts were evaded, while labor, fuel and wood remained at high levels, news mills organized under boom conditions closed down, Europe resumed manufacture and exportation and with debased currency, cheap labor, low standards of living and favorable freights became a factor, but our mills, who are here to stay—Price Bros. for example, control a territory about the size of New Hampshire,—girded up their lions, made some wage adjustments, wrote off half the value of wood pile, faced this competition and continue to ship to the States, England, West Indies, South America, South Africa, New Zealand and Australia, although, strange as it may seem, the latter now has a £3 per ton duty against us. At the same time were carried on the efficiency methods, municipal improvements, technical schools, hospitals, club houses, welfare and social arrangements so necessary in the new districts far from the older settlements and let me tell you these paper mill towns are the finest in the country.

---

* An abstract of a talk on Paper-Making before the Rotary Club, Montreal, January 31, 1922.

Note.— At the close of Mr. Tombs' address, there was shown a very fine moving picture illustrating some of the popular ways of starting forest fires, such as throwing down matches and burning tobacco, leaving camp fires, etc. One scene shows a group of children carefully extinguishing their fire; another shows the Forest Service in British Columbia successfully fighting a fire carelessly set by an auto party. The film was secured through the courtesy of Mr. Robson Black, secretary of the Canadian Forestry Association.

Sometimes one hears grumbling that Canada's birthright has been given away, meaning presumably her forests, water powers, etc. As the Provincial Government now charges a premium of about $1,000 per mile for the right to cut timber also rental of $6.50 per sq. mile per annum and fees of $2.70 per cord on the actual cut, the Province receives a very large annual income from this source, namely, about $5,000,000 or one-third of the total revenues.

We are flattered when we read despatches that Canada has enough timber for hundreds of years, that it has the greatest timber supply in the world, that the United States will soon have to depend on Canada for all their pulp and paper and so forth, but the facts are that while we have indeed lots of wood, much of it is small and not readily accessible being at present non-commercial, like the ice crop of the Arctic.

Norway has reached its maximum of timber production, but its carefully managed forests are never scorched by fire nor wasted. Sweden cannot increase its output much further but Finland and the new Baltic States are more and more to be reckoned with.

The United States, as a whole, has much more timber than we; Russia has more than the States, and South America is the world's greatest reserve.

Dr. Howe, Dean of Faculty of Forestry, University of Toronto, says that during the past fifty years one million square miles of timber land have been destroyed by fire, as compared with one hundred thousand square miles cleared by the axe of the lumberman. It is said that in British Columbia forest fires have destroyed twenty-two times as much timber as has been cut by lumbermen, and the annual plague of fires is accounting for probably three or four times as much timber as can be restored by natural growth.

It is very sad to note that fifty per cent of all bush fires are caused by careless fishermen, campers and picnic parties. Railways are blamed for twenty per cent and settlers and others for the balance: in a dry season like last year lightning has also started a few bad fires.

It is said that the time has come when the need of wood for our industries and for construction makes the practice of forestry just as fundamental to the permanency of our industries as is the practice of agriculture, but mark you there is this great difference—in agriculture we get one or more crops **every year**, but the best return we can expect from the forest, if force into reforestation **one** only in every **30, 50** or **80 years**, according to the species. (Through the carelessness of one fisherman last summer one fire destroyed a tract of 112,000 acres in the St. Maurice Valley, with a potential value of many millions. A total of 1,200 sq. miles were burned over in Quebec last year.)

The Cost of a Mill.

Supposing that this Club in a wea kmoment decided to try and go into the paper business and erect a 100-ton newsprint mill, this would a little more than take care of the requirements of the "Star" and 'La Presse", and could hardly be in operation before 1925. As we could not afford the risk of buying wood in the open market, the first essential is the proper timber limit—at a consumption of 50,000 cords per year, we would need a minimum area of 770 square miles, on which there would be ground rent of $6.50 per mile per year as well as the interest on the investment.

Efficient fire protection must be maintained in summer and in spite of vigorous efforts, losses from fire and disease are apt to be heavy, thereby increasing the average cost per cord. The Government stumpage is $2.70 per cord, there is a carrying charge on the wood left in the stream, which doubles in the case of two-year old wood, and a loss in sinkage of about 10 per cent. of the total cut. Actual costs are difficult and many factors must be considered. During the year previous to the operation, it is necessary to explore the country, locate the cut, place camps, build roads, make stream improvements, and during the previous winter, get in such supplies as will be needed before snow roads are again available, as at the present time the great proportion of wood available is known as two-year wood. Owing to the distance from a mill located within a reasonable reach of civilization, it follows that woods operations must be commenced three years before the wood is required at the mill. The preliminaries accomplished, men are sent around the towns hiring labor, now plentiful. These men are brought to the job at the expense of the company, placed in their camps, generally in August, and work is commenced. Felling, clearing and skidding is the first operation: five men and one horse can handle 200 logs per day on to the skidways ready for the haul—the useful life of a horse is reckoned at four years, tractors are being introduced for the long hauls. After the New Year, hauling to the streams commences.

Roads are one of the biggest factors, the cost depending on the class of road necessary, and the kind of country, but running anywhere from $100 to $5,000 per mile. Cost of dams, piers and other stream improvements mount up, an average dam with a six-foot head costing $20 per foot of length.

Driving in the spring is dependent entirely on the amount of water the Lord provides, but on a large operation a driving cost of $1.75 per cord would land your wood in the main stream, where it would probably be handled by a joint Drive Company, your share of the total cost being based on the proportion of your wood in the drive. Next it is necessary to sort your logs, all of which bear your special mark, from those of other companies, and presuming that our sawmill has been erected, the wood is boomed, taken up on the chain, slashed to the required length, generally 24, 32 or 48 inches, tumbled, barked, and piled, and the logging operation considered finished—this has taken one to two years and before the wood is all in the yard, we will have started to finance and work on our second cut, and sometimes our third, hoping that the price of paper will not go down in the meantime. So far we must have spent $770,000 capital for the limits and some $600,000 to get the first year's wood out, $100,000 in Provincial fees, and another $100,000 for roads, camps, sheds, sleighs, boats, gear, camp outfits, etc.—the output of paper being still in the distance.

A 200-ton self-supporting unit would be more economical, but for a 100-ton mill we would need a water power of about 10,000 h.p. (this alone would cost over a million), a 100-ton groundwood pulp mill, and probably for safety, a sulphite mill with two 25-ton digesters, 45 to 50,000 cords wood, 25,000 tons coal and 350 mill hands. We would not use quite all the pulp manufactured but would have some for sale. In short, a total of ten millions capital would be required to cover the cost of limits, mills, and power development, a reasonable expenditure for town site and the heavy working capital required,—the amount of money needed to finance a modern newsprint mill of relatively small size being astonishing.

Last year the Laurentide Company planted over one million trees—how different from the old time lumbermen who had no stake in the country. Let me emphasize that a larger margin of profit must be obtained by paper manufacturers if they are to provide for reforestation, fire protection and the mounting costs of forest operation.

A Word About the Actual Manufacture.

Two kinds of pulp are used in making newsprint paper — 75 per cent of mechanical pulp, called groundwood, and 25 per cent of chemical pulp, called sulphite. Mechanical pulp is produced by grinding the blocks of wood in machines called grinders. These machines contain large grind-stones running at a high rate of speed, into which the blocks are forced by hydraulic pressure and the wood is ground into pulp, the process taking about two hours. From the grinders the pulp is subjected to a system of screening and refining, and eventually reaches a large tank or chest from which it is later pumped to the mixing machines or beaters.

Chemical pulp—sulphite—is made by an entirely different method. The wood, after being sawed and barked, is cut up into small chips in machines specially designed for the purpose. These chips are then conveyed to large upright cylindrical cookers, called digesters, where they are immersed in an acid made from the gas of burning sulphur and milk of lime, and cooked under a direct pressure of live steam, until all the fibres of the wood are loosened and segregated. This cooking process usually usually takes from eight to twelve hours. The pulp thus obtained is then washed and screened, after which it is ready to be mixed with the mechanical pulp—of course "rotary" burners and "rotary" screens are used.

The two pulps, groundwood and sulphite, are pumped to beaters, or mixing machines, and thoroughly mixed together, color and other necessary ingredients being added during this mixing process. This stock is run through a refining engine called a Jordan and is then ready for the actual conversion into paper.

This is done on a modern Fourdrinier paper machine, costing half a million dollars, running at a speed of from 600 to 1,000 feet per minute, the conversion of pulp to paper taking about ¾ of a minute, the daily output running up to 80 tons per machine.

When the stock obtained from the mixing of the two pulps, as described, is pumped to the screens it contains a large percentage of water, which has necessarily been added to insure its quick flowage and easy manipulation. After passing into the head box, which is directly in front of the screens, it flashes over the endless wire sheet, through press rolls and over woollen felts, losing a large portion of the water. It is then started over the dryers. These are large cylinders heated by steam. Half way through the machine, the web of paper is practically dry, with, however, a rough surface. In order to give it the proper finish to make it suitable for printing, it is passed through a stack of solid steel rolls called calenders. The web has now become a finished sheet of paper, and it is then wound on to reels, and from there to the winder. This winder is fitted with slitters or circular knives, which cut the web of paper lengthwise into the required width, simultaneously as it wound into rolls.

The paper is now ready for wrapping, weighing, and marking for shipment, except in cases where sheet paper is required, when the rolls are cut into sheets on a machine called a cutter, after which they are counted and packed in cases or bales and then weighed and marked. The paper is then loaded into cars and transported to the consumer direct by rail, or to seaboard, where it is transferred to ships and started on the way to its destination overseas. Most of the large rolls measure 73½'' in length by 32½'' and weight 1,200-1,400 lbs. each. Forty go in a standard box car and if properly handled by the carriers, reach Memphis, Tenn., or Brisbane, Australia, without a scratch.

After your mill is running the next thing is to dispose of the product, which believe me is some job these days, although there are 129 dailies in Canada and 2,453 in the States.

I have given some details of a newsprint mill but there are the mills turning out the higher grade papers, such as bonds, writing, ledger, etc., of which we are justly proud. The output of these mills is not so great, but the value of the product per pound is two or three times higher than that of newsprint. A 25-ton modern mill to manufacture book and sulphite bond papers, complete with sulphite mill, would cost two and a quarter million dollars, and employ 250 men, with an approximate payroll of about $300,000 per year. A mill to manufacture 25 tons of high-grade rag papers would entail the same capital expenditure but owing to the many stages in sorting and finishing, which such paper goes through, the number of hands would be increased to about 350.

A mill to make 25 tons daily of cheaper specialties, such as poster, tag manilas, hanging paper, novel paper, and where the chief component is mechanical pulp, would cost about one and a quarter millions and employ 200 hands. These mills would need to purchase any wood pulp required in the open market. Capital would also be required for about 3,000 h.p., which would cost anywhere from $250,000 to $300,000. These specialty mills do not require to be located in the backwoods, so they do not usually have to build up their own communities. About half a million working capital is required or a total of from two and a half to three and a half millions, according to the grades of paper.

If I had time I would tell you that Canada was not the only country making paper, that the United States in 1920 had turned out more than a billion dollars worth, which included over a million and a half tons of newsprint paper, being easily the largest paper-making country in the world, and their mills are much nearer the large consuming centres and pay much less for their fuel and sulphur than Canadian mills do. (Their wood costs are generally higher).

Great Britain who enjoys a world-wide reputation for fine papers, makes nearly half a million tons of news from Canadian and Scandinavian pulps, and while a year ago the Englishman was clamoring for Canadian paper, now he is a competitor. Northern Europe can manufacture about a million tons newsprint annually and has available for export about half of this. Their freight rates to New York for example are about half of what we have to pay. Then, consider the difference in wages. At the present gold value, the German mark is worth about ½c. so the weekly pay cheque of a German papermaker is about $7.75, whereas many of our machine tenders earn over $40 per week. Furthermore, the German Government has been paying a bonus and is now furnishing pulpwood from the State forests at nominal costs.

Our pulp mills have the same competition and the pulp market broke over a year ago under the attack of foreign pulps, which, for these same reasons, were selling far below the cost of manufacture in new, modern and efficient mills on this side of the water.

I simply mention these facts to show that the industry is world-wide and is effected in almost the same way as the wheat market. For example, as German deliveries cannot be guaranteed and Scandinavian countries are short of water and have labor troubles, the worst of the European invasion seems over, and as newspaper advertising and circulation improve, so will the demand for our product.

From the various circulars and some statements in the press, you were no doubt inclined to believe that the manufacture of paper was one of the easiest things to do and that all that was necessary was to write a good prospectus, get somebody else's money, promise a good interest and the whole thing was finished, but a more careful analysis shows that the investment per ton of output is exceedingly high and therefore a most careful and efficient management is required, in order to operate such properties with a fair return to the money invested.

There are many progressive and scientifically run mills in this country, but I can assure you they are not so by accident.

Pumps and their Characteristics

By E. F. DOTY,

(Continued from last issue.)

CHAPTER V.

Power Plunger and Piston Pump.

The usual form is the familiar vertical single acting triplex pump.

The same construction is also used in single and duplex or two cylinder types but the even discharge flow from the triplex pump has developed this pump into a universally standard machine.

Double acting pumps in the vertical type are also built occasionally but the difficulty in properly adjusting the packings of these pumps has prevented them from becoming popular.

The same arrangements of working parts and cylinders are also found in horizontal pumps and here the double acting single and double cylinder types are most common as the difficulty found in packing the double acting vertical pump entirely disappears when applied to the horizontal design.

The principal advantages found in the power pump of this general design is its adaptability to moderate speed drives, positive action and high efficiency under moderate and high pressure service, and these pumps are usually the standard adopted in paper mills for the transfer of heavy stock and are equipped with ball or other form of liquid valves which present an unobstructed opening through the valve ports.

With the single and duplex horizontal power pump it is customary for manufacturers of a general line of pumping machinery to utilize the same design of water cylinders for these pumps as are used in the construction of single cylinder and duplex steam pumps and they are usually well adapted for power pump service, the construction of these with the conventional water cylinder and piston or plunger and water valve equipment consists of the crosshead, connecting rod and crankshaft, mounted in suitable bearings and rotating at right angles to the piston rod with a strongly built frame connecting the water cylinder with the bearings.

All of these pumps can be arranged for belt driving either at the same speed as the crankshaft or with intermediate gearing between the crankshaft and pulley shaft which gives an increased R.P.M. to the pulley 6 to 1 or more, thus the pump pulley is operated at speed very suitable for driving from moderate speed motors, steam engines, gas engines, line shafts or other suitable drivers.

Others standard forms of drives for power pumps are direct gearing, either with single or double sets of gears as may be required to cover the range of R.P.M. between the crank shaft of the pump and the R.P.M. of the driver; silent chain drives either direct from the driver to the crankshaft or with intermediate gears when required.

When operated by gas engines or any type of driver which must be brought up to its full speed without load, a friction clutch is mounted between the shaft of the driver and the pump shaft so that the engine may be started up light and the pump load connected to the pump shaft by throwing the friction clutch into gear as soon as the engine is running at its normal speed and has gained sufficient momentum to carry the load imposed on it by the pump.

The theory and operation of the power pump water shaft usually with ratios of from 3 to 1 to as high as end is identical with that of the crank and flywheel type of steam pump; the calculation for capacity of the single acting type being based on the displacement of the piston or plunger for one stroke and then multiplied by the R.P.M. as the single acting pump makes one stroke in each revolution in which it discharges no water and this product is then multiplied by the number of pistons or plungers in the pump; thus:—

$$\frac{\text{A x S x R.P.M. x N}}{231} = \text{Gallons per minute.}$$

A = Area of one plunger in square inches.
S = Length of stroke in inches.
R.P.M.=Revolutions per minute.
N = Number of pistons or plungers in the pump.
231=Cubic inches contained in one U.S. gallon.

Example:—

An 8" x 8" Triplex single acting pump whose crankshaft is operating at 50 R.P.M.

3—Plungers—8" diameter.

Each plunger has 50 square inches area.

Length of stroke 8".

Therefore:
$$\frac{50 \text{ x } 8 \text{ x } 50 \text{ x } 3}{231} = 259.7 \text{ G. P.M.}$$

As explained under the chapter on steam pumps, this is the theoretical capacity based on displacement of the pistons or plungers and the actual capacity is somewhat less than this due to water slip and this is largely influenced by the condition of the pump valves and packings.

The usual arrangement of the cranks and working parts of the single acting triplex pump is such that the crank pins are located 120° apart and thus equally spaced within the 360° of their path of travel.

This arrangement permits of a very even flow from the discharge valves as the discharge strokes of two of the plungers always overlap each other there is no appreciable pulsation or lessening of the flow of water from the pump.

The gear ratios of power pumps which are referred to above represent the difference in speed in R.P.M. of the crank shaft which is connected to the plungers and the driving shaft to which it is geared also in R.P.M.

Taking the example of the 8 x 8 triplex pump just mentioned and assuming that a gear ratio of 5 to 1 is used this would mean that the crank and plunger speed of 50 R.P.M. x 5 = 250 R.P.M., which is the speed of the engine or countershaft driving the pump.

But in the case of power pumps which are geared to motors, on account of the large ratio between the R.P.M. of the crankshaft and the R.P.M. of standard motors it is often impracticable to cover the difference in speeds with one set of gears and it is customary in such cases to use two pairs of gears to accomplish this purpose and this form of drive is called a double gear reduction.

Taking again the same 8 x 8 triplex pump at its original speed of 50 R.P.M. and assume that we wish to gear drive the pump from a motor operating at 1500R.P.M. With a single reduction of gears this would mean

$$\frac{1500}{50} = 30 \text{ to 1 ratio}$$

which is an impracticable gear ratio for ordinary gear construction but if taken in two steps or so called double reduction it is made as follows:—

1st: Reduction between pump crank shaft and countershaft as before = 5 to 1 ratio, therefore the first reduction is represented by 50 R.P.M. x 5 = 250 R.P.M. of countershaft.

2nd: Reduction between countershaft and motor is represented by:—

$$\frac{\text{1500 R.P.M. of motor}}{\text{250 R.P.M. of Countershaft.}} = \text{6 to 1 ratio for second reduction.}$$

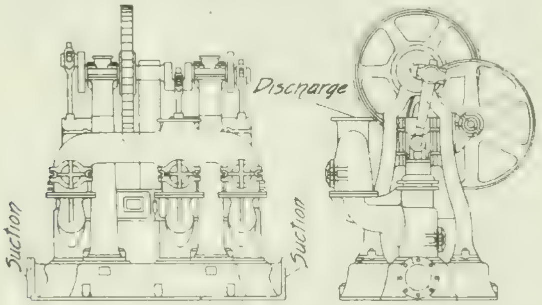

Fig. 18

Fig. 18 shows a power pump arranged with one set or single reduction of gears and suitable for driving by pulley from a countershaft.

The efficiencies or ratio of useful work done for the power delivered averages quite high in pumps of this type and for single acting vertical triplex plunger pumps the efficiencies may be taken as below for pumps handling clean fresh water:—

EFFICIENCY IN PERCENT.

Capacity	Total Heads in Feet.				
G.P.M.	50	100	150	200	300 and upwards.
10	30	40	40	45	50
20	45	55	65	70	75
30 to 100 . . .	55	65	70	75	80
150 to 250 . . .	60	70	75	80	80
300 and above.	65	75	80	85	85

Power pumps with packed pistons may be considered as having efficiencies approximately 5 p.c. less than given in this table on account of the greater packing friction and pumps handling pulp or other heavy and thick liquids will have somewhat lower efficiencies on account of the increased friction of the liquid passing through the valves and passages of the pump.

The efficiencies are represented as follows:—

$$\frac{G.P.M. \times W \times H}{33000 \times E} = \text{Brake H.P. required.}$$

G.P.M. = Gallons per minute to be pumped.
W = Weight of one gallon of the liquid in pounds.
H = Total head in feet, including suction lift, if any and pipe friction.
33000 = Foot pounds represented by 1 Horse Power.
E = Efficiency of the pump taken from the above table.

Example:

Take again the 8 x 8 triplex pump operating at 50 R.P.M. crank shaft speed and therefore giving a displacement capacity of 259.7 G.P.M. as estimated before and assume that we wish to pump fresh water against a total head of 150 feet, we have:

$$\frac{259.7 \times 8.33 \times 150}{33000 \times .75} = \text{13.2 Brake H.P. required.}$$

8.33 = Weight of one U.S. gallon of fresh water in pounds.

In this instance a motor rated at 15 H.P. would be selected to operate the pump as being the nearest standard rating motor and allowing for a small margin of power above the estimated requirements to take care of possible small error in estimating the pumping conditions particularly the total head.

CHAPTER VI.

Rotary Pumps.

As its name clearly implies, the rotary type of pump is one in which the moving element or rotor turns on a shaft and in some designs of rotary pumps there are two rotors mounted on separate shafts working parallel to each other, and arranged to carry the liquid taken in through the suction and deliver it into the discharge of the pump either with intermeshing projections on the rotors or with close running clearances which prevent excess slippage of the liquid between the pressure and suction chambers.

The rotary pump is a positive displacement type in that the quantity of liquid delivered at the discharge is exactly proportional to the volume of liquid which can be contained within the clearance spaces when open to the inlet opening multiplied by the number of revolutions per minute or for any period of time under consideration for example:

A rotary pump having clearance space between the rotor and casing amounting to 231 cubic inches in volume which equals 1 U. S. gallon and operated at a speed of 200 R. P. M. will deliver theoretically

$$\frac{231 \times 200}{231}$$

or 200 U. S. gallons per minute.

We say that it will deliver 200 G. P. M. *theoretically* because there is always some slippage between the rotor and the pump casing again which reduces the *actual* capacity delivered and likewise the efficiency of the pump.

There are but two sources of loss between the theoretical and actual brake H. P. consumed on the theoretical and actual capacity of most types of rotary pumps and these losses consist of slippage between the rotor and shell and friction between the liquid in the pump and the surfaces of the interior of the pump and friction in the pump bearings.

From the fact that the sources of loss of efficiency in this type of pump are few, it will be inferred that the general efficiency of rotary pumps is high and this is true to a large extent of rotary pumps, when they are new and in good condition, with small clearances between rotor and casing and slippage redued to a minimum, but there are very few rotary pump designs which maintain their high efficiency after the clearances become worn and the percentage of slip increases.

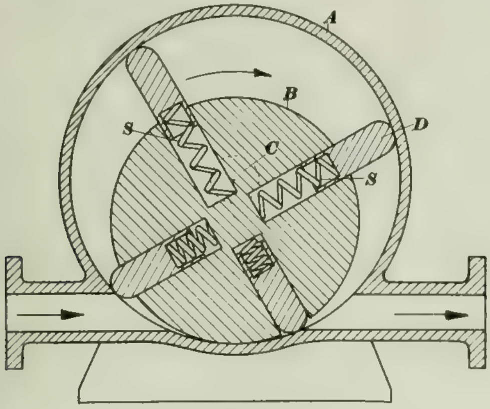

Fig. 19

Those pumps which maintain their original high efficiency must be constructed with suitable means for following up the wear mechanically.

The general principles of rotary pump design are quite old and pumps of this type which conform quite closely the same construction as those of the present day were used as far back as the seventeenth century and were designed by French and German inventors.

Perhaps the original design of rotary pump, which is known as Ramelli's rotary pump, is shown in Fig. 19

This type consists of a cylindrical cassing A and a single concentric rotor B mounted on a shaft C whose center is eccentric to the casing and a series of flat pistons D are carried by the rotor.

These flat plates or pistons are held away from the center of the rotor by springs S as shown by Fig. 19, and the rotation of these plates forces the liquid through the pump. Inlet and outlet are shown by arrows.

Another old form of pump is shown by Fig. 20. This is known as Serviere's rotary pump and dates back to about the same period as the pump shown by Fig. 19.

The principles of Ramelli's and also of Serviere's pump are quite generally used in several well known makes of rotary pumps of the present time.

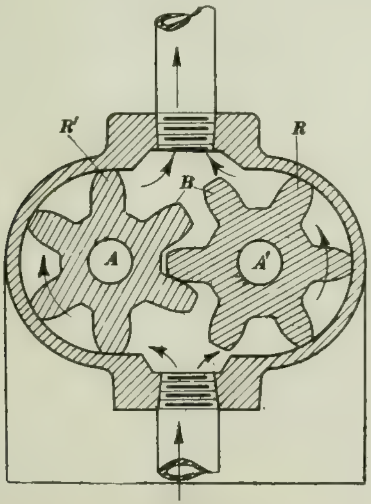

Fig. 20

This pump is the original of the double or two rotor type of pump with two shafts, AA one of which is driven and in turn drives the other by means of gearing and the lobes or teeth B of the internal rotor force the liquid through the pump.

There are many variations of rotary pump designs, most of which employ one of the old original principles with more or less variation in detail.

The rotary pump is a very useful member of the pump family because it can be used in several kinds of pumping successfully where other types are not suitable. For instance; in handling thick liquids which are viscous, stringy and must be handled at low velocities such as heavy crude oil, moderately hot tar, greases and similar liquids and semi-liquids.

Most rotary pumps are suited for operation at low and moderate rates of revolution and on this account must be belt driven or geared to standard speed motors and for this and other reasons their field has been encroached upon to a large extent by the centrifugal pump; but within recent years several new types of rotary pumps have been developed which are especially suited for condenser work and other classes of service where the development of high vacuum is essential. These pumps are designed and built strictly for vacuum service and are not adapted for high pressure conditions.

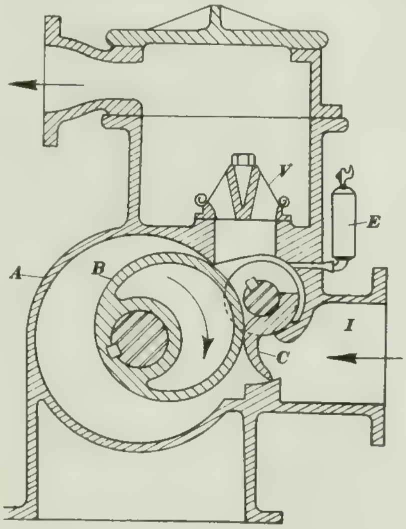

Fig. 21

An important feature of such pumps lies in the sealing of the valves and clearance spaces either by retaining a portion of the liquid which is handled through the pump for the purpose or in the case of "dry vacuum" pumps which are intended only for handling air and vapor a sufficient quantity of liquid such as oil is usually circulated through the pump with the vapor for the purpose of sealing the clearance spaces and thus assist in producing the high vacuum necessary for efficient operation. It will be understood that such circulating liquid as is used for the above purpose is kept continually within the pump and does not pass out of the discharge with the air and vapor handled.

A pump of this improved vacuum type is shown by Fig. 21.

The general construction is similar to the older types of rotary pumps in that the principle of design is a cylindrical casing A and a rotor B or piston revolving eccentric within such casing is a special spring flap discharge valve.

The improvements consist of the design of the inlet and prevention of air from entering same after the clearance space has been filled and started on the discharging portion of the revolution and likewise on the prevention by slippage of air or vapor, which has already been discharged back into the pump casing. The arrangement for circulating liquid for sealing and filling up the clearance spaces is plainly shown in this design.

These rotary vacuum pumps can usually be arranged to be operated at higher speed in R. P. M. than is customary for rotary pumps handling liquids and therefore while their speeds are not as high as standard electric motor speeds so as to permit of direct shaft connection; yet a single reduction of gearing is usually all that is necessary to connect them with fairly high speed motors.

On account of the liquid sealing feature actual metal contact between the casing and rotor may be avoided and therefore high efficiency can be maintained with this type of vacuum pump.

(To be continued.)

POSITIONS OF THE PAPER COMPANIES.

(From Investment Items.)

Riordon Company Ltd.—While the Riordon situation has not clarified to the point where a definite forecast of the future is possible, it is understood that reasonable improvement is being shown. All interests concerned are co-operating with gratifying harmony in carrying out plans for the rehabilitation of the company. On November 17th, creditors granted one year's extension until November 19th, 1922. Interest on the 8 p. c. first and refunding mortgage bonds was deferred on December 1st; the interests of holders of these bonds being conserved by a protective committee. A similar protective committee has been formed to protect the interests of holders of the 6 p. c. general mortgage bonds, due 1929; a substantial working majority of these bonds has been deposited under control of the protective committee and interest on them due upon January 1st was deferred. No committee has been formed to deal with the 6 p. c. first mortgage debentures, due 1942, by reason of the smallness of the issue and the fact that interest on these first mortgage 6's due upon December 31st was paid. It is possible that in due course a shareholders' committee will be formed to work with the bondholders' and creditors' committees.

In the meantime, the current indebtedness of the company is being liquidated through the operation of the Kipawa and Hawkesbury mills, the market for bleached sulphite pulp having shown some improvement in recent months. It is probable that some time in the next few months a definite plan will be put before bondholders, creditors and shareholders looking towards the complete financial rehabilitation of the company. The Riordon position today is more favourable than could have been expected a few months ago and, granted maintenance of improvement in the market for its products, should make slow but definite progress from this time on.

Donnacona Paper Co. Ltd.—Completion of a most satisfactory year is forecasted for Donnacona Papers. During 1920 the company most conservatively applied its large earnings to the improvement of its current position, with the result that throughout 1921, a year of abnormal stress in the pulp and paper industry, working capital has been maintained at a level practically equivalent to total of 6 per cent first mortgage bonds outstanding—and this after payment during the current year of 14 per cent on the common shares. The company is perhaps unique among the larger Canadian pulp and paper companies in having no bank loans. Its very strong cast position at the end of 1920 enabled it to materially write down pulpwood inventory with the result that production costs have been lowered almost as fast as newsprint prices have fallen, earnings thereby having been maintained at a high level through the current year. The Company of which George M. McKee, president of the Canadian Pulp and Paper Company, is managing director, has declared a dividend of 6 per cent out of profits for 1921 on its $1,500,000 common stock. This compares with 14 per cent distributed in 1920. The company ran behind in its preferred dividends to the extent of 21 per cent, 1914-17, but has since made this all up and is now paying regularly on the $2,000,000 of preferred stock.

Mattagami Pulp and Paper Co.—The report of G. T. Clarkson, receiver of the Mattagami company, based upon physical inventories of current assets and appraisal of the company's plant assets, is reassuring.

Plant assets available as security to bondholders and debenture holders are valued at approximately $9,000,000, against principal and accrued interest of $1,800,000 in regard to the company's 6 per cent first mortgage bonds, leaving approximately $7,250,000 as available security for the principal and accrued interest of approximately $4,000,000 7 per cent mortgage debenture stock outstanding. In the matter of asset value, therefore, invested capital represented by the company's mortgage securities appears to be well protected.

As at August 9th, the date of the receiver's report, current liabilities exceeded by $ 400,000 the Company's current assets, the excess of current liabilities over current assets resulting from a drastic write-down of values of inventories of pulp and pulpwood on hand. While ordinarily this working capital situation would be regarded as unsatisfactory, it is not as unfavourable as would appear, because of the marking-down in values above mentioned.

As indicated in the receiver's letter forwarded with the report to the company's creditors, bondholders, debenture holders and shareholders, the company's affairs will continue for the present to be economically administered by the received until such time as consistent improvement takes place in the market for easy bleaching sulphite pulp.

Sooner or later this betterment must take place. In the meantime, the company's mills are being operated and its current indebtedness materially reduced thereby.

As and when the market for the company's product improves in line with general business conditions, steps will probably be taken towards rehabilitation of the company's affairs. In the meantime, holders of the company's securities must needs exercise patience. It is expected in the final working out of the situation that holders of the company's mortgage securities will suffer no greater inconvenience than a temporary delay in interest payments.

Mr. John Erhardt, who, as superintendent of Manufacturing for the McGraw Hill Book Co., has had charge of the making up of the first three volumes of the Industry's Text Book, is now secretary-treasurer of the Barr-Erhardt Press, Que. This was formerly the Premier Printing Co., Quecec, 328-332 Seventh Ave. New York. The address is unchanged.

The way to feel like doing our duty is to do our duty whether we feel like it or not.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3. Fiber from Peat. Ger. patent No. 339,559, Torfoleum Werke Eduard Dyckerhoff.—H. E. W.

B-5. Logging Hook. Can. patent No. 212, 695, Patrick H. Shaffer and Wellington L. Thomas, assignee of one-half of the interest, both of Richwood, West Virginia, U.S.A., July 26, 1921. Claims allowed 3.—A. P.-C.

B-5. Portable Power Saw. Can. patent No. 213,497, James H. Barrett, Blakely, and Tom Shanen, both in Minnesota, U.S.A., Sept. 20, 1921. Claims allowed 6. —A. P.-C.

B-5. Logging Car. Can. patent No. 213,608, Haydn Oswald Williams, Sperling, and William Joseph Miller, Vancouver, both of British Columbia, Canada, co-inventors, Oct. 3, 1921. Claims allowed 12.—A. P.-C.

C.-6. Saw Set Guage. Can. patent No. 213,332, Frank Noe, Seattle, Washington, U.S.A., Sept. 13, 1921. Claim allowed 1. A. P.-C.

C-6. Mechanism for Cross-cutting and Ripping Logs. Can. patent No. 212 589, Elsie M. Pahl, assignor, Bear Creek, Wis., Dorothy L. Giles and Ruth L. Giles, both of Hysham, assignee of a half interest, all in the U.S.A. July 19, 1921. Claims allowed 2.—A. P.-C.

C-6. Saw Guard. Can. patent No. 212, 855, George Philip McDonnell, St. Louis Missouri, U.S.A., Aug. 9, 1921. Claims allowed 5.—A. P.-C.

C-6. Sawing Machine. Can. patent No. 213,333, William Hamilton Pugh, Myrtle, Ont., Canada, Sept. 13, 1921. Claims allowed 2. A. P.-C.

C-6. Sawing Machine. Can. patent No. 212, 994, La Fonderie de Plessisville, assignee of Omeril Tardif, both of Plessisville, Que., Canada, Aug. 16, 1921. Claims allowed 4.—A. P.-C.

C-7. Barking Drum. Can. patent No. 212, 680, A/S Myrens Verksted, Kristiania, Assignee of Adolf August Alpen, Aadalen, Near Heen, both in Norway, July 26, 1921. Claims allowed 9.—A. P.-C.

D-4. Automatic Grinder Dresser. Ger. patent No. 340,164, Schonfelder. — H. E. W.

D-4. Grindstone Mounting. Can. patent No. 212, 651, Francois Xavier Trudel, Shawinigan Falls, Que., Canada, July 26, 1921. Claims allowed 3.—A. P.-C.

E-2; F-2. Recovery of the Methyl Alcohol Formed during the Manufacture of Paper Pulp by Alkaline Processes. Fr. patent No. 522, 795, Hilding Olaf Vidar Bergstrom, Sweden. **Monite Papeterie Francaise**, lii, 688, (Nov. 1, 1921). The condensed vapors from either the digesters or the evaporators are introduced into a fractionating column where the methyl alcohol and volatile impurities are separated as a concentrated solution which is purified by chemical means (acids or metallic salts) either by a continuous or by an intermittent process.—A. P.-C.

E-2; L-0. Production of Technical Alcohol. Papier Ztg., xlvi, 2927, (Aug. 16, 1921-. A description of the industrial processes used in hydrolyzing cellulose and fermenting the sugars formed, and of the production of alcohol from sulphite waste liquors. Ammonium sulphate and superphosphate and yeast extract are added to aid in the fermentation.—H. E. W.

E-2. Methanol in Sulphite Alcohol. Bergstrom **Papier Ztg.**, xlvi, 3465, (Sept. 20, 1921).—H. E. W.

E-4. Filling for Towers. Can. patent No. 213,013, Andrew Miller Fairlie, Atlanta, Georgia, U.S.A., Aug. 23, 1921. The filling consists of blocks, each block being open at both ends and provided with a helical vane or flange of a sufficient width to substantially fill the interior cross-section of the block, so that no straight-line passage is left through the block. Claims allowed 21. A. P.-C.

E-4. Feeding Device for Sulphur Burners. Can. patent No. 212, 690, Fred B. Chappell and the Glens Falls Machine Works, assignee of one-half of the interest, both of Glens Falls, N.Y., U.S.A., July 26, 1921. A spout for sulphur burners, adapted to be connected to the feeding device and to project a short distance into the combustion chamber of the burner, comprises a tubular inlet portion and a trough-shaped discharge portion having an unrestricted discharge end, the arrangement being such that the portion of the spout projecting beyond the feeding device is tubular through approximately one-third of its length and through-shaped trough approximately two-thirds of its length. Claims allowed 4.—A. P. C.

E-4. Combustion Chamber for Sulphur Burners. Can. Patent No. 212, 691, Fred B. Chappell and The Glens Falls Machine Works, assignee of one-half of the interest, both of Glens Falls, N.Y., U.S.A., July 26, 1921. The combustion chamber comprises an enclosing wall, inlet and outlet passages, and a baffle wall arranged out of normal to the inlet and outlet passages to impart a swirling motion to the incoming stream of gas. Claims allowed 7.—A. P.-C.

E-4. Ventilating Sleeve for Sulphur Burners. Can. patent No. 212, 692, Fred B. Chappell and Glens Falls Machine Works, asignee of one-half of the interest, both of Glens Falls, N.Y., U.S.A., July 26, 1921. Claims allowed 7.—A. P.-C.

E-4. Separating Sulphur Dioxide from Gas Mixtures. Can. patent No. 212, 540, Ralph Harper McKee, New York City, N.Y., U.S.A., July 19, 1921. The mixture of gases containing sulphur dioxide is scrubbed with water, cooled still further, scrubbed with concentrated sulphuric acid, and then brought in contact with a silica gel to absorb the sulphur dioxide. The gas current is then cut off from the silica gel, the pressure over the latter is reduced by pumping, part of the gas liberated is heated and returned to the chamber containing the silica gel so as to facilitate the removal of the remainder of the sulphur dioxide. Claims allowed 6. — A. P.-C.

E-0. Sulphite Cooking. Klein. **Papier Ztg.**, xlvi, 2959, (Aug. 18, 1921). A general survey of the subject.—H. E. W.

UNITED STATES NOTES

Stimulated by the results of its educational paper-making exhibitions in several cities, including New York, the American Writing Paper Company is having another this week in the Public Library Newark, N. J., under the auspices of the United Typothetae of America and the Printing House Craftsmen of that city. In addition to the exhibits shown at other places, the Newark show will have as an innovation of particular interest to business men an exhibit of direct-mail advertising campaigns. This will include a history in plans, figures, media, returns and results of recent advertising by merchandising concerns, both large and small. The complete advertising campaign of one concern will be shown in its newspaper, magazine and trade journal publicity, followed by the direct mail media of circulars, booklets, folders, etc., and a system of follow-ups, all producing a large volume of sales.

The Maine Pulp and Paper Company, Inc., with headquarters at Buffalo, and several plants in Maine, filed a petition in bankruptcy last week in the United States Court. Andrew Krieger, its president, lists liabilities at $420,591, of which $125,000 is in secured claims, and assets at $454,021.

The Oswego Falls Pulp & Paper Company, Fulton, N. Y., the Skaneateles Paper Company and the Seal Right Corporation, have been merged into a new organization to be known as The Oswego Falls Corporation. The capitalization of the new corporation is put at $2,500,000. One of the Companies party to the merger, the Seal Right Corporation, operates the largest plant in the world devoted to the manufacture of milk bottle caps and cylindrical liquid-tight cans and containers. The officers of the consolidated company are: President, H. Lester Paddock; vice-president and treasurer, Frank C. Ash of Fulton; assistant secretary, Alden W. Hurd of Fulton; Superintendent, John H. Hollingsworth.

Records of the New York State Forestry Department, which since 1908 has made a practice of supplying trees to persons desiring to plant them, show that since that time a total of 31,944,400 trees have been distributed from the State nurseries and planted in the various reforesting operations. In Herkimer county alone 986,200 trees have been planted by eighty-six individuals and companies. The forestry bureau urges the importance of local timber production, pointing out that more than two thirds of the lumber used in the State is brought from other States and from Canada. It is shown that in many cases the cost of planting and growing timber locally would not exceed the cost of freight on lumber shipped from the Pacific Coast.

A twelve story building is to be erected by the C. & M. Envelope Company on its property, Prince Street from Lafayette to Crosby, New York City.

At the meeting of the New York State Division of the Paper Mill Superintendents Association, held in the Black River Valley Club, Watertown a week ago, H. E. Stafford, superintendent of Knowlton Bros., Inc., Watertown, was elected president of the State division, and William G. Argy, of the Cliff Paper Co., Niagara Falls, secretary. The meeting was well attended and a number of interesting papers were read.

U. S. PAPER MAKERS OUT FOR EXPORT TRADE.

Washington, D. C., Jan. 30. — "The best defensive is an aggressive offensive," a committee of paper manufacturers of the United States told Secretary Hoover today, through President W. J. Raybold of the American Paper and Pulp Association, when they declared that they proposed to meet the competition of European paper manufacturers with an aggressive compaign to retain the existing export business, and to enter the field more extensively. A committee of paper manufacturers had been invited by Secretary Hoover to meet him for a discussion of cooperation between the paper industry and the Department of Commerce, which has just established a Paper Commodity Division in the Bureau of Foreign and Domestic Commerce, and this committee met Secretary Hoover by appointment this (Monday) forenoon.

The committee represented various groups of the industry, making different kinds of paper, and included the following: Geo. W. Sisson, Jr., Racquette River Paper Co., Potsdam, N. Y.; Arthur H. Nevius, Miami Paper Co., West Carrollton, O. R. Frank McElwain, Crocker McElwain Co., Holyoke, Mass.; David L. Luke, West Virginia Pulp and Paper Co., N.Y.C.; Chester W. Lyman, International Paper Co. N.Y.C., James Logan, Pres., U. S. Envelope Co., Springfield, Mass.; Norman W. Wilson, Hammermill Paper Co., Erie, Pa.; Wm F. Brunner, Pres., Paterson Parchment Pa. Co., Passaic, N. J.; Louis T. Stevenson, Mountain Mill Paper Co., Lee, Mass.; C. R. McMillen, Union Bag and Paper Corp. N.Y.C.; Philips Kimball, Liberty Paper Co., N.Y.C.; W. J. Raybold, B. D. Rising Paper Co., Housatonic, Mass., President of the American Paper and Pulp Assn., N.Y.C. and Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Assn., N.Y.C.

That the paper industry intends to combat vigorously the efforts of Germany and Scandinavia to regain foreign markets won by the United States during the war was declared by the members of the committee, particularly in view of the fact that at present the paper mills of the country have a greater productive capacity than the domestic market can consume. A paper mill cannot be operated profitably except at full time, because of the type of machinery required and capital invested, so the industry must, in its present situation, find larger markets for its surplus production if its mills are to earn the profit to which they are entitled. In 1921 the 1706 paper machines of the United States with a capacity of 8,750,000 tons produced only 5,300,000 tons ,or 61 percent of capacity, and there are scheduled for installation during 1922 four more machines, with an additional capacity of 704,200 tons.

"The United States has the best facilities for meeting the world's demand for paper of all grades," the paper men said, "and the present surplus capacity should be used to win new markets for the American manufacturers."

PULP AND PAPER NEWS

Mr. R. T. Grant, manager of the International Paper Company's mill at Three Rivers, P. Q., has been appointed member of the harbor board.

Mr. Jack MacLaurin, of the St. Maurice Paper Company, Montreal was among a party of lumbermen who last week interested a demonstration of Linn tractors in the Adirondacks.

Mr. Hall Caine, Montreal of the Becker Company of America, has been on a business visit to New York.

Montreal seems quite dull this week, after the busynews and excitement of the convention.

Among the paper men spending a holiday in the south are Messrs. Geo. Chahoon Jr., F. A. Sabbaton, and H. O. Keay of the Laurentide Co.

A prominent visitor in Montreal during convention week was Mr. Marx, the well known English designer of paper machinery.

One of the enlivening incidents of the Ontario timber probe was a little tilt between the bench and one of the witnesses as to whether more acid was used in the cooking of pulp than was interjected later in connection with the use of printer's ink on paper. Otherwise the inquiry proceeds with uninspiring monotony though continual interest is maintained by the perpetuity of sensational expectations..

HALTS ACTION AGAINST RIORDON.

Three actions that had been entered in the Superior Court claiming an aggregate sum of $316,516.78 from the Riordon Company, Limited, were ordered by judgment of Mr. Justice Maclennan, suspended until after November 19, 1922, in view of the fact that an extension of the company's credit has been agreed to until that date.

The actions were by the William Markus Company, Limited, $203,567.96; the Canadian Blower & Forge Company for $12,228.32; and the John W. Danforth Company, of New York State, for $100,720.50, all three claims being for machinery and other material supplied to the Riordon Company in relation to its enterprise.

WAYAGAMACK HAS TWO NEW MACHINES.

The annual statement of the Wayagamack Pulp and Paper Co., Ltd., which has just gone forward to the shareholders appears to be a frank, straight-forward statement of the position in which the company finds itself at the end of a year of adverse conditions.

During the twelve months ending November 30 last, which is the period under review, the company's operations resulted in a loss of $156,712, due to the state of the market for craft paper which made itself felt in greatly reduced demand and lowered prices. It is generally agreed that the later months and more particularly those months which have passed since the end of the company's year, have been marked by improved conditions in the trade, which leads the directors to hope for improved earnings during the coming twelve months. The past year has seen completion of the installation of two new paper machines, the possible production of which the company has not been able to take advantage of as a result of trade depression, but in the president's statement to the shareholders, it is pointed out that, under improved conditions, these will permit increased production and lowered costs, which will be an important factor in future earnings.

It is also pointed out that the inventories of stocks of materials for manufacture have been taken at prices not higher than those for which they can now be replaced, and that owing to the fact that the mill was not run to anything like full capacity during the year, a much larger stock of pulpwood was left on hand than ever before.

In connection with present conditions and the outlook for the immediate future, an official of the company states that its volume of business is now heavy, and that while prices are not high, a moderate profit is being made. The export business is good, but Scandinavian competition has to be met in Japan, South Africa, and Great Britain. The domestic trade is also showing improvement.

SELLING POWER FOR ONLY HALF THE COST.

The Ontario government is being faced with a difficult situation in connection with the Hydro's Nipigon power development. Power temporarily is being sold for less than half what it cost to develop, having regard to capital charges. That is one reason why the province is disposed to put the clamps on the Great Lakes Pulp & Paper Company and make it take power from the Hydro.

In government circles it is said that the cost of the Nipigon plant is about six and a half million dollars. The interest charges alone are supposed to reach $390,000 a year or about $44 per horsepower on the 9,000 horsepower now being supplied to the city of Port Arthur. That municipality is paying only $21 or $22 per horsepower. The loss is being added to capital cost, for the present and it is a nice question how it is to be taken care of. If the municipalities don't, presumably the province must.

The plant at present has a capacity of 25,000 horsepower and ultimately will have a capacity of 75,000 horsepower. Were the whole supply marketed, it might be possible to get the price down to $18 or $19 per horsepower. When the other 50,000 horsepower capacity is installed, much lower rates may be obtainable.

The Nipigon enterprise is in much the same position as the Chippawa canal project. While the plant is being operated to partial capacity the output cannot be made to carry all the capital charges. But in the end, both should be paying propositions.

At present Fort William is under contract to take a supply of power but it may be a year before the contract becomes effective. It is understood other inquiries for power are being received which may relieve the situation.—Toronto Star.

You will find as you look back upon your life that the moments that stand out are the moments when you have done things in the spirit of love.

British Trade News

From Our London Correspondent.

London January 21, 1922.

Since the close of the old year I have commented on the adverse conditions that prevailed in 1921 in the British paper industry and these conclusions, influenced by the paucity of orders and dullness in business generally, are enhanced by the Board of Trade figures, just issued, which tell the tale of a "Black Year" in exports and imports. While Shipments of paper to and from Canada show a considerable drop, it is most gratifying to record that the imports of Canadian pulps have not suffered much. Indeed, the supply of groundwood received from the Dominion last year exceeds 1920 and it shows the healthy position into which Canadian mills have pumped so far as the British market is concerned. Let us hope further efforts will be influenced by this success! Today pulp prices are hardening & the pulps from the land of the Maple Leaf will come in for a share of the good things that are going. The paper side certainly wants more attention as the imports received in England are meagre, compared with other sources of supply, and the difference between last year's and 1920 quantities is very material.

Big Canadian Pulp Shipments.

The imports of pulp from all countries are down to roughly one half of those of 1920, which shows that the papers mills in the United Kingdom have passed through a serious crisis in the industry. Only 590, 758 tons, valued at £12,631,333, were recived, as against 1,049,427 tons in 1920, valued at £29,501,450. Actually the tonnage for two years was as follows:—

	1921	1920
Bleached Chemical (dry) ..	14;225	29,446
Unbleached	202,378	512,137
Wet	2,104	13,876
Groundwood (Moist)	367,957.	510,391
Groundwood (dry)..	4,094	28,577

Turning to the countries supplying pulps the following details show the year's shipments:

Groundwood: From Sweden, 25,81 tons (84.176 tons in 1920); Norway, 191,876 tons (305,322 in 1920); Canada, 133,416 tons (88.627 tons in 1920); other countries, 16,684 tons (32,860 tons in 1920). Total valued at £4,277,901 (£7,341,768 in 1920). Here will be seen Canada's rise in the imports. Norway's 191,876 tons are valued at !1,969,607 while Canada's 133,416 tons reached £1,865,175—a difference of 58,460 tons in favour of Norway at a value of £104,432. This gives some idea how Norvegians are selling their pulp; it is a declared value of the customs sheet, which is supposed to be correct.

Bleached Chemical (Dry): From Finland 400 tons, (231 tons in 1920); Sweden, 3,389 tons (5,921 tons); Norway, 8,819 tons, (16,107 tons); Germany, 326 tons (675 tons); Canada & other countries, 1,291 tons (6,530 tons). Total value £673,420 (£1,471,247 in 1920).

Unbleached Chemical (Dry): From Finland, 11,272 tons (35,049 tons in 1920); Sweden, 138,684 tons (337,504 tons); Norway, 31,659 tons, (91,840 tons); Germany, 5,104 tons (8,163 tons); Canada and other places, 15,659 tons (39,581 tons.) In the latter case most of the supplies came from Canada —indeed, nearly all shipments. Total value of unbleached Chemical £7,590,352 (£19,559,548 in 1920).

Taking the exports of all raw materials — pulp, exports and rags—the tonnage was 674,797 (valued at £13,855, 298) in 1921, as against 1,276,113 tons (valued at £33,250,413) in 1920. There is a material drop in the prices of raw materials today compared with 1920. It is the tonnage, however, that requires to be closely followed.

Exports of British Paper.

Taking the exports of all kinds of paper, wrappings, tissues, roofings, bags, boards, playing cards, etc., the total exports of all the British mills, no matter what they manufacture, reached only 1,464,995 cwts in 1921 as against 2,350,132 cwts in 1920 and the values respectively are £7,736,444 in 1921 and £12,810,405 in 1920. This is serious! The exports trade has been dislocated—and still is. Shipments were made as follows:—

An increase of trade in News and Printing Papers is shown between Australia and the British Mills. This is interesting in view of the Tariff preference given by Australia. Somebody must be losing in the Australian market.

All markets for writing paper show a slump, with the exception of Canada. judging by recent figures the Dominion is favoring British writing paper.

Amongst the other exports showing declines are: packing and wrapping paper, tissue paper; wall papers, and coated papers; roofing papers, millboard, strawboard, carboard, and boxes and cartons of paper. These exports show poor trade for one year; in December last the exports were 139,354 cwts as against 241,227 cwts in 1920— corresponding month.

British Imports of Paper.

The imports of papers, boards, etc., reached 6,782,567 cwts in 1921, valued at £11,601,303, as against 12,940,286 cwts at £30,243,744 in 1920. The sources of supply were as follows:—

Printing and writing paper: From Sweden, 572,761 cwts (532,396 cwts in 1920); Norway, 219,557 (594,532 cwts); Germany, 97,273 cwts (179,239 cwts); Belgium, 73, 518 cwts (17,133 cwts); U. S. A., 7,381 cwts (62.537 cwts); Canada, 5,203 cwts); (159,681 cwts); Newfoundland, 745,720 cwts (1,100,834 cwts); other countries, 1,034,055 cwts (749,125 cwts). Total: 2,755,468 cwts valued at £4,752,271, as against 3,395,477 cwts at £9,119,630 in 1920.

Packing & Wrapping Papers: From Finland, 204,560 cwts (410,098 cwts); Sweden, 632,183 cwts (1,890,126 cwts); Norway, 261,729 cwts (916,206 cwts); Germany, 166,267 cwts (223,391 cwts); Belgium, 77,291 cwts (100,865 cwts); Canada, 17,584 cwts (115,807 cwts; other places, 173,249 cwts (247,386 cwts). Total: 1,532,863 cwts valued at £3,051,601 in 1921 as against 3,903,879 cwts at £11,568,011 in 1920.

Coated Papers:From Germany, 16,271 cwts (27,760 cwts in 1920); Belgium 14,744 cwts (43,661 cwts); France, 9,135 cwts (13,625 cwts); U.S.A., 7,177 cwts (10,330 cwts); Other countries 11,976 cwts (29,195 cwts). Total: 59,303 cwts valued at £337,117, as against 124,571 cwts at £810,818 in 1920.

In newsprint buying Sweden has done well and so has Belgium in printing paper & writing paper. Canada and Newfoundland show a serious falling off in the imports of newsprint as the figures above show.

Canadian Blotting Paper.

In British circles there is some uneasiness over the production of blotting paper in Canada. This must be expected and it is hoped makers of Dominion blottings will not overlook the British market, where the consumption is enomous in the year. Canadians have also the Indian, Australian and African markets to cater for. These markets are worth enquiring into for future trade.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, February 7.—Those who attended the annual meetings of the Canadian Pulp and Paper Association must have been struck with the distinctly optimistic feeling which characterised the proceedings. The past year, with its burden of anxieties, is past.—the trade looks with confidence to the future. There is solid ground for this belief that the industry is on a solid foundation. It has, in fact, recovered far more quickly than some other industries, which are still feeling in a degree the slump of 1921. To quote the words of Mr. Wilson. "The outlook is distinctly better than for the period from which we are now emerging. We can look forward with confidence if not with optimism."

In one respect the paper trade is in a different category from some others. It is engaged in the production of articles which are necessary to civilization, and although there may be rises and declines in volume and prices, the industry is now firmly established on a very strong basis.

Business during the past week have not changed to any appreciable extent. The weak spot is the pulp market,where trade is slow, and prices unsatisfactory. Newsprint is in a better position. It is estimated that the mills are running at over 90 per cent of capacity—some are running at full capacity. The strike in Germany, if it continues for even a short time, is likely to lend it the Canadian newsprint industry materially, by diverting orders to this country. It is clear that the stocks in Germany are low, so low indeed that the mills there have been unable to fill the contracts, taken at cut prices, in the States and South America. Some buyers in the latter have already returned to Canada in order to secure supplies, and if other purchasers are convinced that Germany is not to be depended upon for continuous deliveries, they may come to the view, that it is better to pay a higher price and be certain of their suplies than to run risks of unfilled contracts. Book and fine papers continue to meet with a good demand; Kraft is dull, and boards on the quiet side.

As Toronto Views It.

Markets in pulp, paper, and paper stocks manifest firm tone, but little real activity. The rise in sterling and in Canadian funds at New York is looked to as auspicious for the paper and pulp industries of Canada as an influence for broadening markets. Our trade in these commodities with the United Kingdom has been about one tenth that of our trade with the U. S. both in export and import. For twelve months, ending December 1921, we imported "Wood, wood products and paper"

From the United States	33,766,024
From the United Kingdom	$ 2,752,714
and exported-	
To the United Kingdom	16,488,789
To the United States	149,801,738
Total imports of above items	38,239,672
Total exports of above items	186,092,991
Favorable balance	$147,753,319

The Royal Bank's monthly letter refers thus to recovery of Canadian newsprint trade with Argentina, "After deserting Canadian for German newsprint, Argentina, during the last six weeks has again come to buy in the Canadian market." With newsprint, as with other lines, Canada has competed with Germany to some degree of success, though the Germans can still show points on marketing.

There is some local activity in all lines of tissues and this condition hold over a large part of the continent.

Other line reporting some live business are roofing and building papers and their related waste stocks.

There is some movement in the lower grades of paper stock used in boards. Prices for bleached and unbleached sulphite and the various grades of ground wood hold at last week's level.

NEW YORK MARKETS.

New York, Feb. 4 — (Special Correspondence) — Trade activity in paper continues to show a gradual increase. Matters are moving along slowly as buyers are still indisposed to absorb supplies other than to cover direct requirement of paper of most kinds from manufacturing centres to consumers is getting back into a more normal swing. General business conditions are showing a better tone almost every day, which of course is leadng to a larger consumption of paper, which in turn brings a greater number of buyers into the market and also for greater amounts of paper.

The monthly report of the Federal Trade Commission for December shows that the paper industry slowed down quite a little during the final month of year, which is nothing out of the ordinary and therefore bearing no significance. Production of paper of all kinds by United States mills in December totalled 508,284 net tons, compared with 538,876 tons in November and 542,408 tons in October, the last named month proving to be the busiest of the year for paper manufacturers. When it is considered that a good many mills closed down during the last week of the year and that the Christmas holidays curtailed pruduction to no small extent, the output in December held up remarkably well, being larger than in any month in 1921 excepting the two preceding months.

All reports are to the effect that a steady movement of newsprint keeps up and prices show what is probably a firmer undertone than has been evident in a year or more. It is generally conceded among paper men, and by some publishers too, that newsprint prices are well stabilized and that there is small likelihood of any further decline during the next few months. Manufacturers have shown by figures they have compiled that newsprint is being marketed today in many cases at a loss to themselves, which will doubtless continue to be the case until newsprint mills have used up most of the wood they stocked a year or so ago when wood costs were high. Moreover, it is felt that foreign competition will lessen now that prices on domestic print paper are so near a parity with those at which European producers have been marketing paper in America.

It is reported on good authority that the great bulk of foreign newsprint now being sold in this country is priced at very nearly the same level quoted by domestic manufacturers. One large importing concern which has brought in heavy tonnages of newsprint from Sweden in recent months reports selling this paper at 3.40 cents per pound ex dock or warehouse for spot delivery, while quoting from 3.25 cents upward on newsprint for forward shipment from primary sources. There is still talk of foreign newsprint being available at 3 cents a pound but indications are that very little supply, if any, is actually available at this low figure.

Book papers are in an unsatisfactory market position. Those large manufacturers who sell most of their output on contract are fairly well booked up and are operating their plants at close to full capacity, but mills which depend on transient buyers mostly as a market, notably those in the Middle West, are much in need of orders and are naming low prices in an effort to procure business. In fact, it is stated that some mills of this latter class are selling book papers at prices which represent severe financial losses to themselves at the present cost of production simply to keep running and maintain their organizations intact. Machine finished book paper is selling to jobbers in New York at 5.75 cents per pound, and even lower in some instances, f. o. b. this city, while super book is reported available at a trifle above 6 cents f. o. b. New York.

An encouraging development is the improvement taking place in the box board market. Paper box manufacturers are purchasing more board and mills are finding it necessery to increase their production over recent levels to take care of the demand. Prices are hardening and producers seem determined to receive the figures quoted or else decline to market board. Around $38 a ton f. o. b. New York is the everage quotation on plain chip board, and about $42.50 on news board.

GROUND WOOD — There has been no important development in mechanical wood pulp other than that the Federal Trade Commission's report on the pulp industry for December shows that production of ground wood increased substantially during that month, which apparently has commenced to relieve the rather tight supply situation existing not so long ago. The larger production in December may have been due to increased operations of newsprint mills requiring more ground wood, though it is also stated that grinders have been favored with better water conditions in recent weeks, thus enabling them to expand their productive operations.

Quotations on ground wood hold steady at an average of $32 to $33 per ton f. o. b. grinding plants for domestic pulp. Little foreign ground wood is being offered at present excepting for forward shipment from Scandinavia or Finland at such high prices that consumers show little interest.

CHEMICAL PULP — The chemical wood pulp market is characterized by fair activity. Dealers and importers generally admit that consumers are buying mainly to cover prompt requirements and that sales seldom involve other than limited tonnage, but on the who supplies seem to be moving in comparatively good amounts. Prices are steady and no one appears to be discounting the market to effect sales. Authoritative reports are to be the effect that the United States Government has practically dropped the charges of pulp dumping into this country made by domestic pulp manufacturers against European producers, Washington authorities having become convinced that there was no basis to these charges by the documentary proof submitted by importers and also by the reports from Government investigators sent to Scandinavia and Germany.

IN THE SUPREME COURT OF ONTARIO

Between:

CLARENCE D. HOWE, and WILLIAM H. SOUBA, carrying on business under the firm name and style of "C. D. Howe & Company,"

Plaintiffs,

and

THE MUNICIPAL CORPORATION OF THE CITY OF PORT ARTHUR, THE BOARD OF PARK MANAGEMENT OF THE CITY OF PORT ARTHUR, THE KAMINISTIQUA PULP & PAPER COMPANY, LIMITED, and THE CAPITAL TRUST CORPORATION,

Defendants.

Pursuant to the judgment herein and the order of Reference bearing date the 25th day of July, 1921, there will be offered for sale by public auction at the Court House in the City of Port Arthur, in the District of Thunder Bay, in the Province of Ontario, Canada, at the hour of 12 o'clock noon, on Monday, the 20th day of February, 1922, all the estate right, title and interest of the defendants The Kaministiqua Pulp & Paper Company, Ltd., under the lease to the said Company from the defendants, the Board of Park Management of the City of Port Arthur, and also all the estate, right, title and interest of the defendants the Capital Trust Corporation, under the mortgage from the defendant the Kaministiqua Pulp and Paper Company, Limited, on that certain parcel or tract of land and premises described as follows:

"Property includes a 99 year leasehold on approximately twelve (12) acres of land and four (4) acres of land covered by water having a harbor frontage of 401.2 feet. Ground wood pulp mill is of reinforced concrete construction throughout, except roof of grinder and wet rooms which is mill construction type on steel trusses. Building includes complete equipment of transformers, motors, grinders, wet machines, pumps, hydraulic presses, bailer, heating plant for ground wood mill having daily capacity of thirty (30) tons of dry pulp. Layout is modern and equipment first class. Mill is ready for immediate operation. Wood room is steel and corrugated iron construction on concrete foundations with equipment for slashing tand barking forty (40) cords of wood per ten hours. Boiler house is of steel and corrugated iron construction on concrete foundations with boiler capacity of 220 h. p. Mill is located within two miles of Port Arthur post office and main line street railway passes site.

The said land and premises being more particularly described by metes and bounds in the lease and mortgage registered in the Registry Office for the said City of Port Arthur and copies of which will be produced at time of sale and on which property are said to be erected a building suitable for the manufacture of ground wood pulp, as described in the above particulars.

Inspection of the said premises may be had at any time during the day, prior to the day of sale, by any intending purchaser, on application to the solicitor for the Vendors.

The property will be offered for sale subject to a reserved bid.

The purchaser will be required to pay down the sum of Ten Thousand Dollars on the day of sale as a deposit on account of the purchase money. This deposit will be forfeited by the purchaser if he fails to carry out the purchase on a good title being made under the terms and conditions of the lease on which the property is being offered for sale. The purchaser shall pay a further sum within sixty days after the day of sale to make with the said deposit the sum of thirty per cent of the purchase price, and the balance of the purchase money in two equal instalments of thirty-five per cent of the purchase price, in six and twelve months from the day of sale. All the deferred payments are to bear interest at the rate of seven per cent from the day of sale and to be secured by mortgage on the property sold.

The purchaser shall search the title at his own expense and shall have fifteen days from the day of sale in which to make objections. If no objection be made within that time, the purchaser shall be deemed to have then accepted the title. In case the purchaser shall make any objection which the vendors shall be unable or unwilling to answer, the vendors may by notice in writing delivered or mailed to the

TRADE·MARK
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SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft Pulp mill in Finland except one, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

—ALSO—

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SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Wood Pulp Union, Helsingfors, Finland

a combination of the foremost Ground Wood Pulp and Board Mills in Finland, makers of various kinds of boards and dry and wet Brown and White Mechanical Wood Pulp.

Get the most for your money by getting next to our qualities and prices!

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NEW YORK OFFICE:
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Telephone: Murray Hill 4246-47

CHICAGO OFFICE:
1932 Conway Building.
Telephone: Main 1770-71.

INQUIRIES SOLICITED:

purchaser or his solicitor cancel the agreement of sale and return to the purchaser the deposit money without interest, costs, damages, or other compensation.

The Vendors shall not be bound to produce any abstract of title of any deeds or evidences of title other than those in their possession or control.

Taxes, rates and assessments, if any, including local improvement rates, insurance premiums and rentals, shall be apportioned to the date of completion of sale.

In all other respects, the conditions of sale are the standing conditions of sale of the Court.

Further particulars may be had from A. J. McComber, 415 Whalen Building, Port Arthur, vendors' solicitor.

Dated at Port Arthur this nineteenth day of January, 1922.

HUGH O'LEARY,
Local Master at Port Arthur.

Jan. 21-28-Feb. 4-11-18.

I tell you women, fooling away your time hugging and kissing a poodle dog, caressing a Spitz, drinking a society bran mash or cocktail and playing cards, is mighty small business compared to moulding the life of a child.—Billy Sunday.

FUTURE

As we turn to the new year's page in business upon which very little is yet recorded but the encouraging outlook for 1922, it seems incumbent upon us to hesitate, before ruling off 1921 and express to you our genuine appreciation for the part you have had in making the year now closing one so filled with pleasant business relations despite the handicaps under which all industries were operating.

1922 Holds Much Promise!

We are earnest in our wishing that the new year will be a tremendously successful year for you, selfishly hoping that we may continue to enjoy your Jordan patronage.

In our service to you during the year's we feel far more capable of demonstrating our appreciation than we are to adequately express at this time.

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OFFICERS OF CANADIAN FORESTRY ASSOCIATION.

At the Annual Convention of the Canadian Forestry Association the following officers were elected:

The President, for 1922, Mr. Dan. McLachlin of Mc Lachlin Brothers, Arnprior, Hon. Vice President, Hon. Charles Stewart, Minister of the Interior, Vice President, R.H. Campbell, Director of Forestry, Ottawa, Manager, Mr. Robson Black. Mr. G.H. Kaine, Deputy Minister of Lands and Forests, Toronto, was added to the directorate for Ontario, also Dr. C.A. Rutherford of the Board of Railway Commissioners, Ottawa. Mr. Lomer Gouin, Minister of Justice and a director of the Laurentide Co. was made a director of the Association for Quebec. Mr. G.H. Auld, Deputy Minister of Agriculture for Saskatchewan and Hon. W.H. Motherwell, the new Minister of Agriculture in the MacKenzie King Government, were made directors for Saskatchewan.

MAKING WOOD ROOM EQUIPMENT

Among the well-known manufacturers established in Canada that have taken up the manufacture of machinery for pulp and paper plants is the Canadian Mead-Morrison Company, Limited, who, at their factory at Welland, Ontario, have already built for the Canadian trade a large number of Wood Room Machines such as Barkers, Splitters, Chippers, Chip Crushers and Chip Screens. This line of Wood Room Machinery formerly made in the United States is well known to the pulp and paper manufacturers as it has been in most successful use by them for many years, and it is pleasing, of course, to know that another concern is making such machines in Canada, thereby accomplishing the double purpose of saving money and giving employment to Canadians.

Quite recently the Canadian Mead-Morison Co. Ltd., has brought out a new and larger capacity Chip Crusher and a Shaker Chip Screen, both of which embody notable improvements.

In addition, the "Mead-Morison" line of Power House equipment such as Skip Hoists, Weigh Larrys and Conveyors, has been installed in a number of plants, among the more recent of which might be mentioned the skip hoist and weigh larry equipments for the new boiler house at the Brompton Pulp & Paper Company's plant at East Angus Que.

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Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE, P. Q., February 16, 1922. No. 7.

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The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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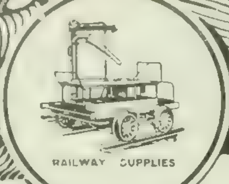

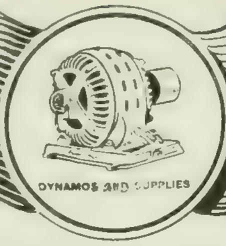

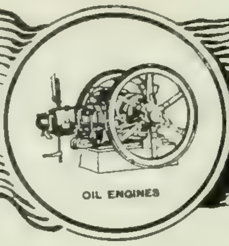

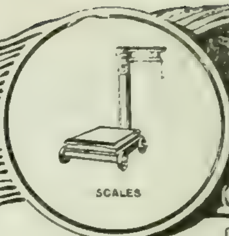

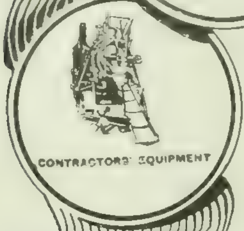

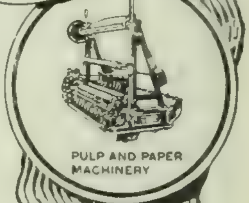

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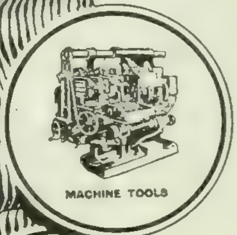

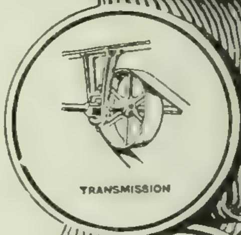

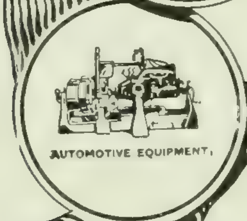

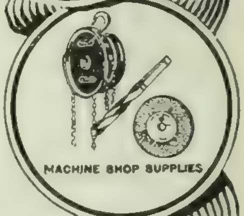

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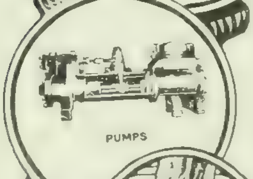
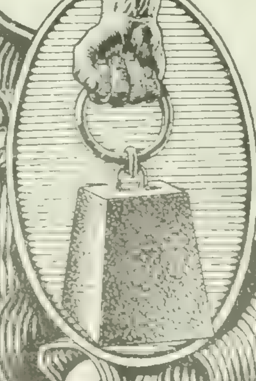


Each department is ready to extend the fullest co-operation in the solution of your problems because it is in charge of experienced men who know how best to meet your particular requirements.



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:-: EDITORIAL :-:

PULP AND PAPER AT McGILL.

It is hardly more than once in a lifetime that an opportunity like the present comes to a University for establishing a work that will have such a wide influence as would the establishment of a course in pulp and paper making at McGill University. There is no educational institution on the continent better provided with equipment for all the work properly incident to such a course, as the well-known university so ably presided over by the world renowned Gen. Sir. Arthur Currie. It would be but another instance of Sir Arthur's foresight and initiative to recommend and assist in the establishment of Canada's first school of pulp and paper manufacture. There is no industry in Canada which would profit more from a specialized course of this character and there is none better able or more inclined to give willing and helpful co-operation.

The present is the most opportune time that could possibly be conceived. The announcement has just been made of the munificient bequest of Mrs. E. B. Eddy in the establishment of a chair of Industrial Chemistry, with particular reference to the working out of problems in the pulp and paper industry. There is no name in Canadian Industry more highly respected than that of the man who established and built up the great manufacturing enterprise at Hull, a name that is known the world over as a manufacturer of pulp and paper, matches, lumber and numerous other articles produced from wood. It is natural and fitting then, that the Mrs. E. B. Eddy chair should carry with the obligation that the endowment should be devoted particularly to the study of problems and giving instruction in subjects connected with wood and its utilization. There are few chemical industries in Canada that do not in some way touch upon the chemistry of wood so that this subject becomes very near being the keynote of industrial chemistry in Canada. Certainly the pulp and paper industry, apart from the source of this bequest, has a proper claim to the major activities of such a professorship. There are few lines of industrial activity which hold greater promise of development or which have greater need for high class research work than is to be found in the many problems confronting those interested in the products of the forest. These problems range all the way from many puzzling points in the fundamental chemistry of the wood itself, even going back to the soil and the atmosphere where the tree grows, and on down through the many processes of conversion to the properties of pulp and paper and the elusive molecules of the mysterious substances in the waste liquors. Pages can be written simply in the tabulation of the problems that are even now pressing for solution. It is a curious fact, furthermore, that the attack on one problem is almost sure to open up three or four more that depend on it and that in some cases must be solved before the original line of research can be followed to completion.

Instruction in pulp and paper subjects and research in fundamental problems to be most effective, requires familiarity with, or expression in terms of mill equipment. The proximity of the well equipped paper mill of semi-commercial size at the Forest Products Laboratories of Canada which are housed in McGill property, furnish unsurpassed opportunities. Besides the paper making equipment already installed and only occasionally used, there was recently built an additional building designed to accomodate two digesters, one for pulp making by acid processes, and another for alkaline processes. Specifications were worked out for this equipment through the cooperation of the advisory committee to the laboratories appointed to the Technical Section of the Pulp and Paper Association so that the apparatus could be ordered and installed without delay. In fact, it is understood that there has been an appropriation of the Dominion Trusty Branch for this purpose.

Mention was made in these columns last week of the desirability of a closer cooperation between the University and the Laboratories and now that the announcement has been made of the endowement of the Mrs. E. B. Eddy Chair, it seems that nothing should stand in the way of working out an arrangement that would be most beneficial to all parties.

IS IT WORTH IT?

From time to time as reports have gone forth regarding the manner and progress of the investigation into a well-known timber case in Ontario, the question has been raised as to whether the result of the commission's investigation would be worth the cost. Whether it is worth the cost depends a good deal on the terms in which we measure the expense and the benefits. The expense can be readily calculated in dollars and cents. The results can be expressed in dollars and cents, as to the amount that will be paid into the provincial treasurer hitherto uncollected from the sale of timber from crown lands. We believe however, that the principal benefit to Ontario and the

Dominion will not be the timber dues not collected, whether it be from fraud or neglect, but will be the better appreciation on the part of the public of the value of our timber. Another and perhaps the greatest lesson of all, is the necessity for accurate and reliable cruising and estimating of our forest resources. The statement made in court by a Government official proved a condition of affairs that we have suspected for some time, namely, that the amounts of timber in the stand can be determined beforehand and than found by a cruiser. It is, of course, impossible to state the extent of such a practice as this but there must be a lot of it, because time and again the editor has been advised that a logging operation very frequently cuts out more timber than has been estimated. Where it does not do so appears to be the case where a person selling the stand or stumpage has an object in making it appear that the timber is better than it really is, such as the instance referred to in these columns not long ago with regard to certain limits in Labrador.

Timber cruises and estimates are not by any means all crooked but there is no doubt whatever that the majority or at least, a great many of them, are woefully inaccurate. We shall not quote the evidence submitted in the investigation in Ontario by an assistant crown timber agent appointed to the position through the influence of the head of the company charged with defrauding the Government, who testified that he signed a report giving in considerable detail, the extent and condition of a certain stand of timber, even recommending a fair price but without having made a cruise himself or any knowledge from personal investigation of the timber.

We maintain that the enlightening of the public that such methods have been followed and the awakening of the conscience of the public, and we hope of timber inspectors, is worth all it costs.

TIME TO START SOMETHING.

Several years ago, the Great Lakes Pulp and Paper Co. obtained concessions as to certain valuable timber limits in Ontario. The agreement called for the construction of mills within a certain time at the expenditure of a certain sum of money and these obligations were not carried out by the company. The Government has been lenient in enforcing the terms of the agreement, largely, no doubt, because of the unsettled and depressed condition of business during the past year. The company has succeeded in setting aside the requirement that power from the Nipigon development be used in the plant but the Government is now demanding that work be started in the construction of the mills or that the concession be cancelled. It looks as if this would force the company to take action immediately or lose the large amount that is claimed to have been invested already in the proposition. Good timber limits with available water power and convenience to markets are too scarce in Canada now to be forfeited except under the most extreme circumstances. It will be very surprising therefore, if the Great Lakes Pulp and Paper Company allow their rights in the back Sturgeon limits to lapse.

COBWEBS.

In connection with the appointment of Mr. P. C. Larkin as Canadian High Commissioner in London, it is stated that a suitable Canadian Building is planned. We hope the plans include provision for a permanent and adequate exhibit of Canadian products. It should also be the headquarters of the Canadian Board of Trade, so that when a visitor is interested in a particular product there will be someone at hand who can talk business with him.

JUST TO REMIND YOU.

(We clipped this from a Mill Bulletin.—Ed.)

Not so very long ago when there was a shortage of Pulp and Paper we increased our efficiency and produced a quality product in quantities not considered possible before. *But what are we doing now?*

Our equipment is in better condition now than ever before to make a quality product in quantities. Quality is the thing that counts, and to permit us to meet present day prices we must produce quality and quantity more efficiently than ever before; but *we have failed in a few instances in the very recent past.* Our shortcomings were not due to machinery or processes, but due to the personal factor, the men who do the work. A little neglect here, a little indifference there, not very much as a whole but just enough to make a few tons of inferior product, and what is the worst of it, *the men who were at fault used their efforts to deceive themselves* by hiding these defects so that it would not be noticed around the mill and thus escape the criticism of their foremen. *What have they accomplished?*

You all know that every ton of pulp we ship is re-used and if anything is wrong the Mill using same will find out about it, and you all know that every roll or sheet of paper is not used in the whole as shipped by us but sheet by sheet unfolded or unrolled, and consequently the slightest defect will become visible to the user.

Therefore, you *who are paid to perform a certain work, do your duty* and do not let things happen which affect the quality of our product; if you see anything wrong correct it, if you see anyone else do something wrong bring it to the attention of your foreman, because if allowed to go on unnoticed it will affect you and all of us.

There is not enough business to go around and the one who makes the best product will get it. If we want to keep our mill running we must all work together and work hard to make the best that can be made; if there are some men working with you who are indifferent it will be to your advantage to report them because when the mill closes down due to their fault you will be the sufferer just the same.

Think it over at your leisure and realize the consequences that can be caused by the *indifferent worker.*

Experiments have shown that even a pint of beer will lower intellectual power, impair memory and retard simple mental processes, such as addition.

The Engineer and the Operator as Associates.

W. J. ZIMMERMAN, Engineer,
H. S. TAYLOR Limited, Montreal, Quebec.

In the succesful accomplishment of any industrial development there are two human factors clearly represented, first he who conceives and creates the development, and second he who must use it for the purpose intended. These two factors therefore have a common interest, and their relation should be seriously considered, that the underlying principles may be thoroughly understood, and the full value of their association obtained.

A development cannot be scientifically created without a thorough understanding of its use, nor can it be used intelligently without a practical knowledge of the methods and productive elements used in its creation.

It can be clearly seen that the ultimate success of the creation in question depends upon the mutual understanding of these two human elements and their working in accord one with the other. Such co-operation can but reflect in its results a completeness in the finished development that otherwise could not be obtained.

This condition is applicable to any industrial development and particularly so for a pulp or paper mill, whether the objective be improvements, additions or an entirely new mill.

The two human factors here involved are the engineer and the operator, the engineer being he who brings the mill into being, and the operator he who must use the mill, and achieve the results that are expected of it.

Let us for the moment liken a pulp and paper mill to a tool in the hands of an operator, from which certain work is expected. The operator working with this tool is expected to show definite results, and if perchance these results are not forthcoming, who is at fault, the operator or the tool? If the tool was the product of the operator there would be no question,—the operator's training however is in the use of the tool and not in its manufacture. As a user his ability may be unquestioned, his training giving him a clear insight into every requirement that must be met. Shall the engineer or manufacturer in this case avail himself of this experience, or shall he pass it by as foreign to his own work. There is but one answer, avail himself of it by all means for this experience can but be of great value in the betterment of the product, and thus reflect to the credit of both the engineer and the operator.

The lines of work and special interests of the engineer and operator, however, afford an ever present opportunity for separating their work and applying themselves individually to it, each to the exclusion of the other, and if this course is thoughtlessly followed it can but lead to the time when both the engineer and operator look forward to the day when their paths will separate, and arguments cease. There could have been no such condition if the success of the work itself, the common interest, had been united in the minds of both parties.

The fact that a mill must first be built, and then operated does not mean that the positions of the Engineer and Operator should independently one follow the other. In other words there should not be a definite time where one man's work ends, and the other's begins. Rather in the process of bringing a mill and its operation into existence, these two men's work should so overlap that there would be no evidence of where one's work left off and the other's began. During this overlapping period, however, there is a time when each must have complete charge, and it is evident that confusion as to the relations of their respective positions is likely to exist if these men meet in a spirit of opposition, one to the other.

The period through which one gradually surrenders his control to the other, is the most critical, and to successfully accomplish this transition, the two factors must cooperate to the fullest extent, as at this time they are brought into closer contact than at any other period in their relations..

An attitude of mutual understanding and recognition of each others position and a conscientious regard for it throughout the period these two men are on the work together, will involuntarily be the means of holding them closely together, and thus successfully prosecuting the work, and a greater completeness will necessarily result when the problems that are common to the work of both are taken up as a unit, and not each for himself. The value of their association is soon realized by both parties, each has confidence in the other, and accepts assistance as given that must be beneficial to themselves and the work.

In practically all industries past experience has shown the existence of an antagonistic attitude between engineer and operator. The reason for this attitude is quite apparent. The tendency to isolation, as a result of their training, has caused them to discriminate and look at each other across an imaginary barrier that has been falsely erected by their technical and practical viewpoints. This barrier is the thought that they had nothing in common. A thorough understanding of the requirements of the work, however, would have convinced them that in place of having nothing they had much in common. In many instances this antagonistic attitude is provoked and supported by the engineer through his insufficient knowledge of the processes involved and the requirements of operation, and he is thus handicapped by his lack of one of the main factors essential to mutual recognition.

Engineers specializing on the details of any industry must have a fundamental knowledge of the operation of any installation for which they are responsible, and on work where such engineers are engaged a much closer union exists between operator and engineer. The reason is apparent, for the engineer can, so to speak, talk the language of the operator.

The operator in turn will have a much greater confidence in the engineer and through this confidence enter into a closer association with him on any part of the work that demands their mutual interest.

To avoid the chance of confusion and possible antagonism, the relative position of these two men should be clearly defined. Let us for instance consider their positions in the construction of a paper mill. The paper mill engineer with the knowledge of operation of the complete plant ever in mind, plans and lays out the work. He stands during this period alone, for in this stage of the development dealing with location, surveys, estimates, etc. his training is such that the operator can give him no assistance and is therefore, at this time, unnecessary to the project.

To properly proportion the various units and to plan their relation each to the other is special work that the operator has no cause to be familiar with, hence the engineer is rightfully in full charge of the work up to and through this period. The preparation of the plans and the building of the structures now follow. This work deals mainly with structural problems encountered in the buildings taken from the layout as previously prepared by the engineer. Again therefore his position is clearly defined.

The time that the operator is first interested and his support given the engineer, is when the equipment, including all operating parts, is considered, dealt with and installed. His position through this period is in an advisory capacity, assisting the engineer through his knowledge of the requirements of the various equipments and their relative setting.

The operator and the engineer first come into actual contact on the work at the time of commencement of installation of equipment, and remain continuously in contact until the departure of the engineer. There is, however, during this period a change in their positions. From the commencement of installation of equipment to the commencement of operation the engineer is in full control of the work, and the operator in an advisory capacity as well as overseeing the installation of equipment. From the commencement of operation to the time when it is complete throughout, the engineer remains in an advisory capacity, assisting the operator and keeping a close watch to guard against any interruption that might take place through the newness of equipment and buildings. At the time of complete and successful operation his work is finished and from then on the operator stands alone.

Among the many conditions that must be met by the engineer is one that often instigates the refusal on the part of the operator to work in harmony with him. The one referred to, is encountered at the time of consideration and selection of the equipment that is to be installed. The engineer in his wide experience has had the opportunity to compare the many different types of equipment and ways of the industry, and further is fully experienced in the latest improvements. The operator's experience, however, generally speaking, has been localized, his long periods of service with single installations causing a tendency to favor certain familiar types rather than an improved design that has been admitted superior. The operator due to the demands in his own particular location has not had the opportunity of outside investigation, whereas investigation is an important part of the engineer's work and he is therefore, fully acquainted with the superiority of improved equipment. The engineer is therefore, in a better position to bring the necessary equipment to the notice of the operator, and his recommendations might better govern; the preference of the operator, however should receive the greatest consideration and should be embodied in these recommendations, unless the engineer is convinced by previous experience that this acceptance will result in a lowered efficiency of operation, and it is then his duty to satisfy the operator that his own selection is the preferable.

Having an intimate knowledge of the requirements of any installation of equipment or process, and actually operating the equipment or carrying out the process greatly differs in their demand. The engineer, while necessarily in command of the first requirement, is not an operator, and the operator is not an engineer, and for this very reason they need each other on work where a mutual interest is imperative. The true paper mill engineer is anxious to cooperate with the Operator, and in turn asks that the operator cooperate with him. Such a desire is logical in that, with the engineer and operator both present, working for a common purpose,—the successful future of the development,—the true principles of organization demand such cooperation and the engineer and operator cannot but realize the betterment to their work when in full accord with each other.

PAPER INDUSTRY OF U. S. VOTES ON AMERICAN VALUATION.

The results of a ballot of the entire membership of the American Paper and Pulp Association on the American Valuation Plan (See Pulp and Paper Magazine, Nov. 24, 1921), is being compiled, and shows a large majority in favor of this plan. The first question in the ballot of the entire association, on the question "The American Valuation Plan or an equivalent plan is necessary for the proper application of a tariff law at this time," has received to date 103 votes in the affirmative, as against 7 opposed. The second question, "Prompt passage of tariff legislation by Congress is necessary to the proper 'come-back' of business," received 106 affirmative votes, and 4 voted against. Only one out of 110 voting was against the proposition that paper manufacturers should take more active interest and part in the application of tariff laws by Customs officials.

ABITIBI STARTS EXTENSION CLASSES.

The Broke Hustler announces this important news and opportunity as follows:—

Don't forget the courses in Groundwood Pulp Manufacture and Steam Plant Operation, which begin about February 15.

These courses will be of great value to everyone. They will be simple enough for even those not connected with the operating departments to follow, and at the same time will contain enough technical information to be of real interest and value to the man who is actually working in that department. The men who do not work in the Ground Wood Mill and Steam Plant, will find that by taking this course their knowledge of the whole industry of pulp and paper making is considerably broadened and therefore they are better men in their own particular jobs.

Those who are in these departments will find a new angle at which to look on the work they are doing daily, with pointers which will increase their efficiency, and therefore their value to this mill or some other mill.

It is a chance to qualify for a bigger job. Don't miss it!"

One of the best men I ever knew gave to this country three splendid sons, loyal, capable and conscientious. I once asked him how he managed to do it. He said: "I have always made my boys my companions."

Pumps and their Characteristics

By E. F. DOTY.

(Continued from last issue.)

CHAPTER VII.

Centrifugal Pumps. Part I.

The centrifugal pump is perhaps in more general use in paper and pulp mills than any other type and it is therefore important that engineers and operatives should be familiar with their fundamental principles and operating characteristics. This pump is entirely different in regard to its method of operation than any other known type.

It will be noted that all of the various types of pumps which we have previously considered operated on the "displacement" principle; so called, for the reason that the capacity or quantity of water delivered by the pump is in direct proportion to the speed at which it operates, regardless of the pressure or head pumped against.

In the centrifugal pump, as we will shortly explain in detail, the capacity or quantity of liquid pumped and the pressure, or head pumped against are both dependent upon the speed or velocity of the revolving wheel or impeller and both the capacity and the head bear a separate and distinct relation to the speed; both of which are inseparable from each other however.

It may be advisable to explain here the general definition and give a brief description of the simplest form of centrifugal pump.

Centrifugal pumps are so named for the reason that centrifugal force or the change of pressure due to rotation is the most important factor in their operation.

A centrifugal pump in its original and simplest form consists of an impeller, sometimes called the "wheel" or "runner" which is mounted on a shaft and revolves within a casing or "shell".

In operation the liquid enters the impeller at its center and due to the action of the vanes of the impeller it is forced radically outward and is discharged from the outer edge or periphery of the impeller into the casing.

While the liquid is passing from the inlet to the outside or discharge of the impeller it is receiving energy from the vanes of the impeller with the result that both its pressure and velocity are increased. When the liquid is discharged from the impeller into the casing a large proportion of the energy which it has had imparted to it by the vanes is velocity or kinetic energy.

Part of this velocity or kinetic energy must be conserved as it leaves the impeller in order to obtain the desired capacity of liquid to be discharged: the balance of this velocity is transformed into pressure in the casing and an efficient pump depends very largely upon the proper design of the casing that will convert this excess velocity into pressure with as little loss as possible.

In Fig. 22, we show a sectional diagram of a simple form of single stage centrifugal pump which follows quite closely the original historical designs which are credited to both American and European engineers of a century ago. This figure shows a section through the pump in two directions; the view to the right is parallel with the shaft, and to the left at right angles to it.

The large arrow near the top of the impeller I indicates the direction of rotation which is clockwise and the smaller arrows show the direction of flow which the liquid follows in passing from the central section inlet A of the impeller to the discharge to the casing.

It will be noticed that this figure shows a casing C of the volute construction, which was one of the first of the early improvements made on the original design, which had a concentric casing with no change of area in the cross section and resulted in a constantly changing velocity as the liquid was driven through the casing.

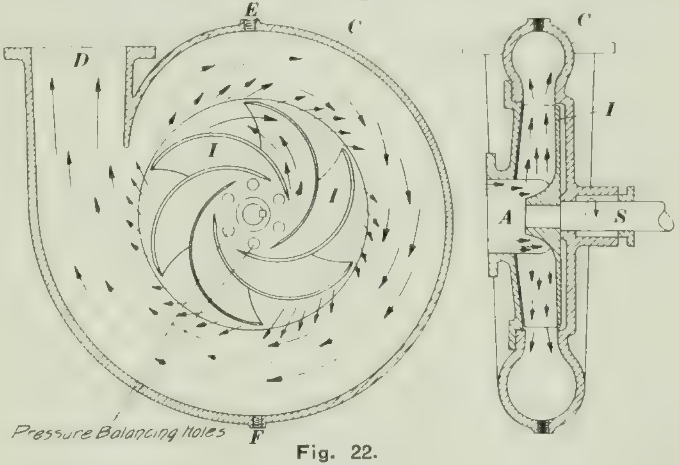

Fig. 22.

The volute casing provides for a constantly and gradually changing area of cross section, increasing towards the discharge opening, D which results in a practically constant rate of flow through the shell. This prevents the formation of eddy currents and shock losses due to sudden changes of velocity and therefore increases the efficiency in the conversion of velocity into pressure.

The second important improvement made by the early designers on the original design consists in the backward curvature of the impeller vanes, those in the original pump were straight and radial or nearly so. The backward curvature of the vanes permits the designer to control the velocities of the liquid in passing through the impeller; also to provide for proper inlet and outlet angles to meet certain pumping conditions and the formation of the vanes may be such as to permit the liquid to follow a natural path through the impeller with the least possible friction.

The volute form of casing and backward curvature of impeller vanes are generally recognized as the most logical and efficient design for centrifugal pumps of both the single and multi-stage types at the present time.

These conclusions have been reached after many comparative tests with different designs of casings and impellers.

It was formerly considered necessary to introduce stationary vanes in the casing between the outside diameter of the impeller and the outer part of the casing called diffusion vanes, these were constructed with the object of forming passages of proper area and angular direction to carry the water from the impeller outlet to the casing proper and secure an efficient reduction of velocity and change into pressure, while passing between these two points.

The introduction of these stationary vanes does improve the efficiency slightly over that obtained by a pump without diffusion vanes but this increase of efficiency is obtained only for certain conditions of capacity and head and is not secured over the wide range of capacities under which a centrifugal pump is usually required to work. This increased efficiency is also obtained at greater first cost for the pump and higher cost of upkeep and repairs on account of wear and corrosion of the stationary vanes so that the great majority of manufacturers have abandoned this type of pump except for special cases where extreme efficiencies are desired and the pumping conditions are practically constant. A more recent improvement in the design of centrifugal pump casings consists of the volute form of suction inlet leading to the impeller.

It will be noticed that with the simple form of pump shown by Fig. 22, that the water enters the impeller inlet radially or parallel to the axis of the shaft. This requires that the liquid must be picked up by the impeller while it is traveling at right angles to the direction in which the impeller rotates and at a difference in velocity between that which the liquid is moving in the suction pipe and that which the impeller revolves; thus resulting in a shock or inlet loss due to the change of direction and sudden change of velocity imparted to the liquid as it is picked up by the impeller.

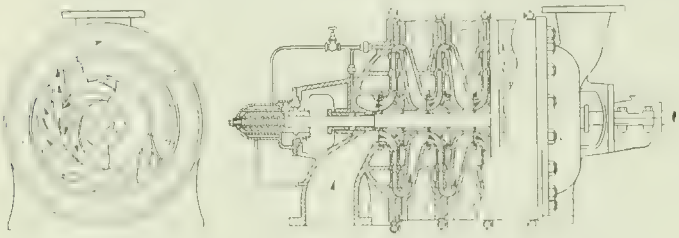

Fig. 23.

Priming is necessary when starting this type of pump; connection E is for this purpose. The casing can be drained at F.

Classification.

With the above general treatment of our subject, we will now consider the classification of forms and types of centrifugal pumps.

A. The first sub-divisions consist of two classes:—

1st: Volute Pumps.

These are pumps having a discharge casing or shell constructed of the volute or spiral form and sometimes with the suction passages of volute form also; all as described above.

2nd: Turbine Pumps.

These are pumps having a discharge casing usually of the concentric form, with uniform areas at all sections surrounding the impeller, but sometimes they are made with volute shaped casing.

The distinguishing feature of the turbine pump is the stationary diffusion vanes between the impeller and the free waterway of the casing.

These pumps derive their name of "turbine pump" from the resemblance to the construction of the reaction type of water turbine.

There was, and possibly still is, in some quarters, an impression that the so-called "turbine pump" is a different type from the well known and simpler form of centrifugal pump, but such is not the case, as the theory and operating characteristics are quite similar in both pumps, the introduction of the diffusion vanes is for the one identical purpose as explained already in this chapter and they do not necessarily change the shape of the pump characteristic curves.

In Fig. 23, two diagrammatic views of a three stage "turbine" pump are shown and the direction of the liquid flow through the pump is clearly indicated.

B. The second sub-division consists also of two classes into which the original sub-divisions are again divided.

1st: Single stage pumps: These are pumps which usually contain but one impeller which developes the total head against which the pump operates and single stage pumps may either be of the volute or "turbine" designs.

These single stage pumps are suitable for operating against heads which range from low to moderately high, in a general way single stage pumps are best suited for operating against heads from 0 to 200'. Although in several instances these have been successfully used for much higher heads, when operated at high speeds, still the general run of commercial pumps will come within the range of heads stated.

The exception to the general rule that single stage pumps are equipped with but one impeller is in the case of the so-called multirotor pumps which contain two or more impellers; for instance, birotor pumps, containing two impellers and tri-rotor pumps which contain three impellers in one casing.

These two or three impellers as the case may be located in one casing, are operated in parallel, which means that each impeller takes its water at the same inlet pressure and discharges it at the same outlet pressure, and all impellers discharge in to a common discharge chamber the casing being arranged with suitable inlet and outlet passages to permit such operation.

The object of the bi-rotor and tri-rotor construction is to permit the use of higher speeds in R. P. M. of the driving unit through these designs with impellers of smaller diameter than could be used with single impeller pumps for the same conditions. A typical diagrammatic arrangement of a tri-rotor pump with double suction inlet impellers I is shown by Fig. 24.

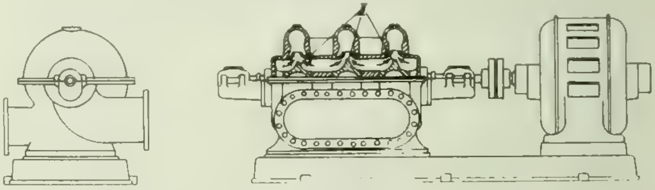

Fig. 24.

These are pumps having a discharge casing or shell capacities are required to be pumped against low heads and at comparatively high rotative speeds. Their development commercially has not been very extensive and has been generally in connection with large condensing water requirements, but it is increasing somewhat.

Second: Multi-stage pumps: These are pumps having two or more impellers mounted on a shaft and housed within the same casing, these two or more impellers are so located, and with suitable water passages in the casing, that the water discharged from the first impeller is carried into the suction inlet of the second impeller so that they operate in series; which means that the head or pressure developed by the first stage impeller is delivered to the inlet of the second stage impeller which in turn increases the head or pressure or in other words the total head against which a two stage pump will operate is the head which each of its impellers is capable of developing multiplied by two, or in the case of a pump with more than two stages the head developed by one of its impellers is multiplied by the number of impellers, which indicates the total head which the pump will develop.

For instance a three stage pump having three impellers of such characteristic and such speed that each impeller will develop a head of 150 feet and deliver its normal capacity. This head multiplied by three impellers would mean that the pump would deliver its normal capacity against a 450' head.

A characteristic section of a three-stage multi-stage pump is shown by Fig. 25. Note that the size of the parts decreases as the pressure increases. Fig. 23 illustrates a three-stage pump of the turbine type.

C. The third subdivision consists of two more general types as follows:—

First: Single Suction or Inlet Pumps, sometimes called side suction pumps in which the impeller is made with an inlet opening in one side only as shown by Fig. 22 (view to the right.) With this type of impeller there is an unbalanced area equivalent to the area of the suction inlet less the area of the shaft; this unbalanced effect being due to the difference in pressure at inlet and outlet of the impeller. The area at the suction inlet is exposed to the inlet pressure while the equivalent area at the opposite side or back of the impeller is exposed to the outlet or discharge pressure.

This difference in pressure results in thrust, the tendency being to force the impeller and entire rotor to which it is attached, towards the suction or inlet side of the pump. A pump with excessive thrust or without proper means being provided to balance to absorb such thrust will not operate satisfactorily; the result of such condition being, quick and excessive wear caused by the impeller rubbing against the shell; overheating and excess wear on the thrust bearing and consequent increased power consumption and lowered efficiency due to the presence of one or both of these conditions.

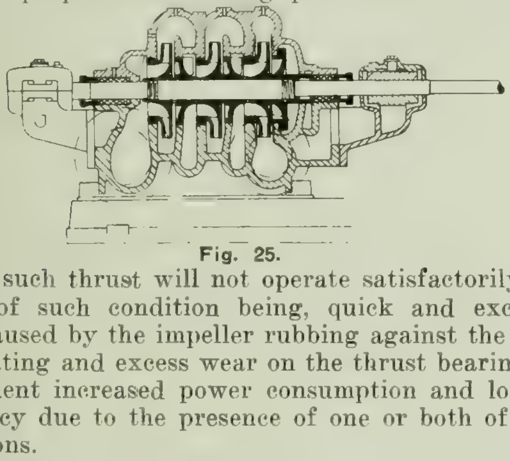

Fig. 25.

While the single suction type of impeller is not the ideal design, yet there are many pumping conditions, and some of these are well known to paper mill engineers where they are the most suuitable type and therefore when their use is desirable means should be employed for taking care of the end thrust.

There are three ways in which this can be accomplished as follows:—

(a).—By means of a thrust bearing attached to the shaft of sutable design and ample strength to absorb the entire thrust on the impeller. This is not considered good practice.

(b).—By a combination of a balancing chamber located in the casing behind the impeller and amring cast on the impeller with a small running clearance, and also a thrust bearing to absorb the thrust not taken care of by the balancing chamber.

Fig. 26 showns a typical design of a balancing chamber B and it will be noted that the removal of pressure from the back of the impeller A depends on maintaining a small clearance C between the balancing ring R on the impeller and the bore of the running fit at the balancing chamber. On account of wear a thrust bearing must be provided of ample strength to hold more thrust than calculations for a new pump indicate as necessary. In order to prevent pressure building up in the balancing chamber from leakage at the running joint, holes H are provided through the central web of the impeller which release such pressure back into the suction chamber.

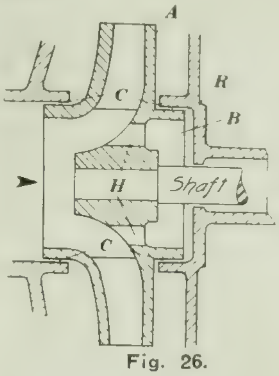

Fig. 26.

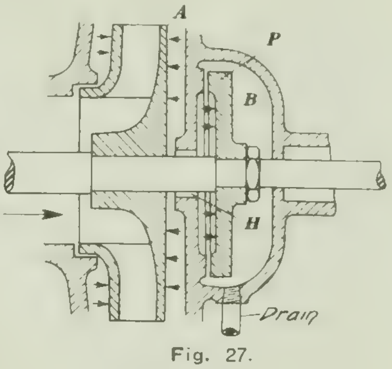

Fig. 27.

(c). —By means of hydraulically balancing the end thrust through counterpressure.

The usual and generally most effective means of accomplishing this is by the introduction of a balancing piston or disc which is mounted on the pump shaft behind the impeller. A typical design is shown by Fig. 27, and indicates the direction in which the pressure is exerted on the unbalanced area of the impeller and also in the opposite direction on the area of the balancing piston P (other letters are the same as in Fig. 26.).

It will be noted that the area of the balancing piston is slightly larger than the unbalanced area of the impeller and that as the impeller tends to move over towards the suction due to the presence of discharge pressure on the unbalanced area, the ports between the pump shell opposite the unbalanced area of the impeller are opened by the movement of the impeller towards the suction; this admits the discharge pressure to the opposing area of the balancing piston so that a balance is at once effected and the balancing piston revolves within its chamber with a very slight opening between the running fit of the balancing piston and the stationary clearance surface on the casing.

Such leakage as takes place past these clearances is, of course, a loss and results in a loss of efficiency in the pump but under favorable conditions the loss may be less important than the power absorbed by the thrust bearings. The leakage is usually carried back to the pump suction through a by-pass pipe. With the hydraulically balanced type of pump a thrust bearing is never used as it is entirely unnecessary and the pump must be free to move endwise so that the balancing piston may be permitted to find its proper location in order to effect a perfect balance. The hydraulic balancing device is effective and fairly durable when handling clean water which does not have corrosive properties; when the water has corrosive chemical properties or deposits scale as is frequently the case with hot water for boiler feeding the hydraulic balancing device becomes ineffective for balancing purposes and on account of the deposits of scale it will open up to such an extent that a large percentage of the water handled by the pump is by-passed from the balancing chamber back to the suction, which very materially reduces the capacity and efficiency of the pump.

Second. Double Suction or inlet pumps in which the liquid enters the impeller at both sides through openings of equal area.

With this construction there is theoretically no unbalanced area on either side of the impeller and the original double suction pumps, which were designed at a period when centrifugal pumps were only used for low heads and moderate speeds, were not equipped with thrust bearings and very good results were obtained with them.

In later days, however, with the coming of high speeds and heads it was found that a small thrust bearing is advantageous on double suction pumps as it was found to be practically impossible to ensure foundry and machine work of sufficient accuracy to prevent a slight amount of thrust and threfore a bearing of either the collar or ball type is usually provided which will take care of a small thrust load in which ever direction it may develop.

The double suction type of pump is practically ideal for any pumping conditions with some few exceptions such as handling heavy or fibrous paper stock.

The suction openings into the impeller being divided, requires smaller diameter of such openings than in the case of single suction pumps, this enables the double suction pump to have smaller diameter of impeller and consequently higher speed than the single suction pump for the same conditions of capacity and head.

D. The fourth sub-division also relates to impeller type:—

First: Open impellers which may be either single or double suction in which the vanes are supported from the central hub and the liquid passing through the impeller is in contact with the inner surfaces of the casing which confines the impeller.

This is the original design of impeller and is fairly efficient under low heads and is also a desirable form to use for handling fibrous material such as sulphite pulp, but the slippage past the vanes at the clearance between them and the casing and the extra friction of the liquid passing through the shell reduces the efficiency of this type of impeller, and such losses are bound to increase as these clearances wear and become greater.

Second: Enclosed impellers, which also may be either single or double suction in which the vanes are supported from the central web and are also enclosed or shrouded at both sides.

In this type the liquid passing through the impeller does not come in contact with the sides of the pump casing and the slippage can only take place at the running clearance space surrounding the suction inlet to the impeller. This will also increase with wear but in most designs the clearance ring can easily be replaced by a new one whenever sufficient wear takes place, and the efficiency may again be brought back to normal.

In high efficiency pumps it is customary to construct them with enclosed type impellers made of bronze and also to machine and polish the inner and outer surfaces in order to reduce the friction to the smallest possible amount.

E. The fifth and final subdivision consists of:—

First: Horizontal pumps, which means that the axis of the shaft is in a horizontal position. This is the most common form of pump and that which is always installed when the conditions will permit.

Second: Vertical pumps which means that the axis of the shaft is in a vertical position. These pumps are only used in cases where it is necessary to submerge the pump below the surface of the liquid to be pumped or when it is necessary to set the pump end below the motor or driving pulley in order to get within suction limits of the liquid to be pumped or to prevent the motor from becoming flooded on account of occasional rise of water level.

The vertical type of pump may be subdivided into:—

Pumps which are actually submerged in the liquid they pump, and which should be equipped with bearings which are suitable for operating under water and pumps known as vertical non-submerged type which are either set above the water level on the suction side or are located in dry wells so as to be accessible. This latter type is the most desirable arrangement of vertical shaft pump and should be given preference of the two kinds of vertical pumps whenever circumstances will permit. (To be continued.)

PRINTING SALES IMPROVED.

(American Writing Paper Co. Bulletin.)

The figures for Printing Sales and Paper Purchases for December show very little change over that of the previous month. A slight increase in sales for the month is, no doubt, due to holiday business of a special nature as the paper purchases remained practically uniform. This in itself, may be taken to indicate that the industry is recovering its normal position slowly but surely and that the new year is pretty certain to continue the upward trend in printing sales and the purchases of paper stock.

Paper tonnage and purchase values run about parallel, showing a more stable market than in months past. This indicates that the supply is keeping reasonably in advance of the demand.

The volume of Printing Sales for the first half of the year shows a constant decline with a slight recovery during June. The usual shortage of orders in July further reduced the volume of business for that month but recovered nicely during August. Very little change was noticeable throughout September. The fall months were somewhat of a disappointment as the volume of sales decreased to within 8 per cent of the lowest point attained since November, 1919. However, the holiday business for December brought the volume of sales back to nearly what it was in September.

The tonnage of Paper has kept within a reasonable ratio of Paper Purchases. Early in the year, with the cost of material high, the tonnage was low, but with greater value. As the cost of raw material lessened, the price of paper dropped, so since May there has been a steady increase in paper tonnage, although the value of paper purchase has not increased in the same proportion. This would indicate that the price of paper and the tonnage are very close to the normal of 1918.

The large amount of paper in the merchants' warehouses and in the printers' stock rooms at the beginning of the year, together with the constant decline in volume of Printing Sales, materially affected the volume of paper purchases. At no time throughout the year did they reach the normal of 1918.

Within the last three months of the year there has been a marked improvement in the purchase of printers' stock, indicating that the large supply on hand with the printers and merchants has been reduced to the minimum and with the lowering in price of raw materials and the consequent reduction in price of paper, printers' purchases have been stimulated.

Annual Meeting Of The C. P. & P. A.

REPORTS OF SECTIONS.

The reports of the various Sections of the Canadian Pulp and Paper Association not only show its valuable and varied activities, but also give a good history of the year's work and a review of conditions.

Newsprint Section.

Mr. President and Gentlemen:

The mills represented in the Newsprint Section have to report an unusually difficult year, in which the producers were called upon to contend with exceptional conditions brought about principally by universal business stagnation.

The beginning of the year found the industry at high tide of demand and market price. The recession in general business which began soon after the new year brought in its train a radical slump in newspaper advertising, particularly in the United States where from 80 p.c. to 90 p.c. of the newsprint produced by our members finds a market. The situation was aggravated, furthermore, by the importation into the States of a quantity of European paper, not in itself sufficient in normal times to upset the equilibrium of the market, but which was undoubtedly used in the existing circumstances to the detriment of the producers on this continent. Abnormal exchange conditions and cheap European labor were the principal factors making this competition possible. European paper also benefitted by cheap ocean traffic rates as compared with the excessive rail freight charges in Canada and the United States.

Under these circumstances it is not surprising to find that newsprint production and shipments in Canada during the year have fallen off somewhat from those of the preceding year. The surprise is, perhaps, that the decrease has not been greater. Canadian mills, have, on the average, suffered proportionately less than United States mills.

Production and shipments by the mills reporting to this Section, by months during the year, were as follows:

	Production Tons	Shipments Tons
January	71,518	67,360
February	63,607	61,575
March	65,619	64,185
April	69,221	66,260
May	49,308	49,980
June	54,715	56,412
July	68,844	66,732
August	72,295	75,435
September	68,983	68,164
October	75,481	79,056
November	74,537	73,380
December	78,599	79,433
Total	812,727	807,972

The figures by years for the past five years compare as follows:

Year	Tons	Value
1917*	689,847	$38,868,084
1918*	734,783	46,230,814
1919*	794,567	54,427,879
1920*	875,696	80,865,271
1921	812,727	

The export market continued to absorb the larger proportion of the output, exports by months being as follows:—

Month	Tons	Value
January	57,341	$6,532,034
February	52,835	6,266,050
March	75,773	9,162,330
April	47,463	5,241,893
May	44,182	4,682,393
June	42,380	4,295,181
July	57,318	5,539,623
August	65,321	6,015,305
September	61,456	5,503,368
October	65,707	5,510,604
November	63,381	6,926,465
December		
Totals (Eleven months)	633,157	$65,675,246

Seven new machines with a total rated capacity of 558 tons daily were brought into operation during the year, bringing the maximum daily production up to 3,342 tons, or 1,002,600 tons a year. Two additional machines are now in course of installation and are expected to be in operation early in the year, which will bring Canada's maximum newsprint productive capacity up to 1,032,600 tons annually, an amount approximating 50 p. c. of the total newsprint consumption on the North American continent.

Labor and other costs have been liquidated to some extent during the year but by no means proportionately to the liquidation that has taken place in the market price of paper.

The year has demonstrated more than ever the value of co-operative effort and mutual understanding among the members. There have been five meetings of the Section, at which problems, such as that afforded by the Australian market where Canadian paper is being discriminated against through an unfavorable tariff, have been dealt with. A proposal to co-operate with the large newspaper publishers in an effort to increase the consumption of newsprint received much consideration and is still under advisement.

What the future holds in store for the industry it is dificult to foresee. It depends in a large measure upon the sagacity and the wisdom of the industry's responsible heads. Newsprint buyers, speaking broadly, are extremely well organized. They have never failed to bring their united effort to bear in depressing the price of paper although they have strenuously and persistently denied the right of the producers to indulge in similar tactics to the opposite end. The danger is that they may carry their aggression to a point which will again reduce the production of paper to an unprofitable basis and thus in the long run defeat their own ends. In the interests of both producers and consumers the newsprint manufacturers should stand out against this short-sighted policy.

GEORGE CHAHOON, Jr.,
Chairman.

Chemical Pulp Sections.

(At the initial meeting of the Chemical Pulp Section, in January, 1921, it was decided that the Section should be divided into two, one to be composed of the members producing Sulphate Pulp only, to be known as the Kraft Pulp Section, the other of members engaged in producing Sulphite Pulp, to be known as the Sulphite Section. Mr. C. R. Whitehead, of the Wayagamack Pulp & Paper Company, was chosen as Chairman of the Kraft Section and Mr. E. L. Crooker, of the Laurentide Company, Limited, as Chairman of the Sulphite Section.)

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* Canadian Government figures.

Mr. President and Gentlemen:

The year 1921 will be recorded as one of the most difficult ever experienced by the Chemical Pulp industry of Canada. The demand for all grades of kraft and sulphite slumped very materially soon after the beginning of the year and with it prices also went to pieces. By midsummer the demand had all but ceased and some of the larger mills temporarily stopped producing. Towards the latter part of the year the market had revived to some extent but was still far below the high point reached in the year preceding. As illustrating the market decline in 1921, as compared with 1920, it may be said that while the Canadian kraft pulp mills reporting to the Association produced 76,370 tons and shipped 48,479 tons in the last seven months of 1920—May to December inclusive—the production for the entire twelve months of 1921 amounted to only 75,949 tons and shipments to 61,309 tons.

Production and shipments of sulphite, in tons, for the years 1919-1921 are shown in the subjoined statement:—

	1919		1920		1921	
	Production	Shipments	Production	Shipments	Production	Shipments
News	253,279	66,161	329,914	107,001	253,566	50,253
Easy bleaching	83,065	80,251	172,357	173,588	86,831	69,690
Bleached	56,228	52,744	108,414	100,120	85,498	82,895
Totals . .	392,572	199,156	600,685	380,709	425,895	200,838

The annual productive capacity of all Chemical pulp mills in Canada of pulp for sale is now estimated at 617,496 tons, comprising 148,400 tons of kraft and 469,096 tons of sulphite. On this basis last year's production of kraft, by the mills reporting, amounting to 75,949 tons, represents 51 p. c. of total capacity, and last year's shipments, amounting to 61,309 tons, represents 41.1 p. c. of total capacity. On sulphite, last year's production of tons represents 91 p.c. of capacity and last year's shipments of 202,838 tons represents 44 p.c. of total capacity.

The following is a comparative statement of exports of chemical pulp of all kinds from Canada during the first ten months of 1920 and 1921, and indicates the extent to which the demoralization of the trade extended:

	1920		1921	
	Tons	$	Tons	$
Sulphate	116,677.65	10,855,035	72,614.85	5,600,451
Sulphite, bleached	81,153.95	11,846,625	53,389.4	5,630,845
" unbleached	246,967.6	26,518,269	84,015.2	6,891,509
Total	444,799.2	$49,219,929	210,019.45	$18,122,805

In analyzing the conditions responsible for the unfavorable year, first consideration has necessarily to be given to the world-wide depression in trade and the universal period of liquidation through which every industry was compelled to pass. A contributing cause is found in the invasion of the American market by European producers who had been practically debarred therefrom from the time the war put a temporary embargo on trans-Atlantic commerce. The Europeans naturally were desirous of recovering as much as possible of their United States trade and were assisted in so doing by their lower cost of production and the high premium on the American dollar, as well as by the low cargo rates from European to American ports. Surprisingly large reserve stocks of pulp were also brought to light in the Scandinavian countries and these, coupled with the urgent necessities of most of the foreign producers to liquidate at any or all cost, still further demoralized the market for United States and Canadian producers and made it practically impossible for them to obtain anything like an adequate return on their sales.

As to the future, the only thing that can be said with assurance is that it is generally assumed that the worst is over. The latter part of the year witnessed a general betterment of conditions and as most of the mills resumed operations at or near capacity, the ensuing year promises to be much better than the last. The degree of prosperity which will fall to the lot of the pulp industry will depend very largely upon the revival of the demand for paper, of which evidences are already in sight, and of business in general.

The pulp manufacturers have found their association through the C. P. & P. A. of much assistance during the past year. Monthly statistical charts showing the production of the various grades of sulphite pulp, classified as "News". "Easy Bleaching," and "Bleached," have been issued at regular intervals during the year and have proved of much value.

A monthly exchange of statistics between the Chemical Pulp Sections and the Scandinavian Cellulose Association has been inaugurated during the year and has been found of much assistance to the pulp producers in both countries.

In November the Sections were favored with a visit from Consul T. Lundgren, Secretary of the Swedish Cellulose Association, and Messrs. Lennart Norstrum and Gustaf Asplund, Swedish pulp manufactuersrs. A conference between them and representatives of the several Canadian mills producing kraft and sulphite pulp was held at which there was a general exchange of views. Arrangements were entered into for extending and enlarging the exchange of information between the two bodies.

The Sections look forward to a continuance of these helpful efforts at co-operation and mutual service during the year to come and to their expansion as opportunty arises.

All of which is respectfully submitted.

C. R. WHITEHEAD,
Chairman Kraft Section.
E. L. CROOKER,
Chairman Sulphite Section.

Mechanical Pulp Section.

Mr. President and Gentlemen:

One year ago, in a survey made by this Section of the conditions then existing in the mechanical pulp industry of Canada, an estimate was made that the 1921 production would amount to 1,306,300 tons, made up of 899,000 tons for use by the producing mills and 407,300 tons for sale. The extent to which the actual production has fallen below this estimate indicates, in some measure, the falling off in demand and consumption of groundwood pulp and the unsettled conditions that have prevailed throughout the industry during the greater part of the year.

The mills reporting to the Association give the following as their production and shipments for the several months of the year:

Production and Shipments of Mechanical Pulp by Months.

1921	Production Tons	Shipments Tons
January	52,929	1,102
February	45,722	831
March	50,705	751
April	70,224	1,321
May	58,544	13,371
June	52,135	9,515
July	64,903	15,050
August	68,381	27,079
September	70,527	19,729
October	78,372	33,660
November	76,245	31,530
December	80,079	27,582
Total	768,766	181,521

The figures fall considerably below those for 1920 which sum up as follows:—Production, 846,514 tons; shipments, 202,316 tons.

It is estimated that the productive capacity of the groundwood mills has been increased during the year by about 800 tons a day or 240,000 tons a year. New newsprint machines brought into use in Canada during the year are estimated to have increased the productive capacity of the newsprint mills by 558 tons a day or 167,400 tons a year. The estimated increase in pulp production includes 200 tons a day by a mill which is now being equipped with news machines which are expected eventually to absorb this additional output.

Exports of groundwood pulp for 1921 amounted to 3,006,878 cwts., valued at $7,093,895, as compared with 6,086,883 cwts., valued at $17,574,816 during the preceding year, and were distributed by months as follows:

Exports of Mechanical Pulp by Months.

	1920		1921	
	Cwts.	$	Cwts.	$
January	609,206	972,574	133,951	396,136
February	266,826	472,383	86,464	244,049
March	289,092	562,308	139,868	284,092
April	198,664	506,369	64,070	131,427
May	279,439	779,710	326,290	754,288
June	892,309	2,136,767	196,090	370,072
July	838,118	2,528,993	408,976	974,246
August	816,081	2,809,266	435,955	1,233,684
September	424,689	1,877,053	658,027	1,674,042
October	536,329	1,986,807	557,188	1,031,859
November	263,976	1,016,184	712,196	1,065,700
December	672,154	1,926,392		
Total	6,086,883	$17,574,816	3,719,074	$8,159,595

These figures tell their own story and it is perhaps unnecessary to dwell upon them or to emphasize the fact that the year was not a good one for the manufacturers of groundwood pulp. The principal factors contributing to the unfavorable year were the marked decrease in demand, an oversupplied market and falling prices generally. European imports into the United States also exerted an adverse influence on our market there.

The immediate future appears to be slightly more promising depending upon improved trade conditions generally and a revival in the demand for newsprint and other grades of paper.

The Section held together well during the year and afforded the members encouragement and assistance in meeting their unusual problems.

All of which is respectfully submitted.

L. R. WILSON,
Chairman.

Book and Writing Paper Section.

Mr. President and Gentlemen:

During the early part of the year 1921 business was extremely quiet and seemed to slow up until about July when it began to pick up. From that time until the end of the year there was a gradual improvement and, while most of the mills were running full time, they found that owing to the small orders they were only getting about 80 p.c. production.

During the year our section held 10 meetings, at nearly all of which every mill in the section was represented. The same spirit of co-operation which has prevailed in this section since it was organized is still maintained and is greatly benefitting those connected with it.

Raw materials have been very plentiful and the qualities have improved very much, which has enabled the mills to improve their grades and get their standards back to pre-war qualities.

Wages last year were reduced about 30 p.c., but are still over double pre-war wages.

Prices were reduced from 30 p.c. to 50 p.c. according to the grades and now seem to be on a rock-bottom basis.

There has not been much exporting from Canada of these grades during the past twelve months, the percentage being a very small fraction of what had been shipped in the previous year. This is largely accounted for by the fact that there was a world-wide depression and also that the European prices were much lower than they were here. Exchange was very much in their favor as most of the exporting from Canada had been done to New Zealand, Australia, South Africa and South America.

We had two advertising campaigns during the year with the object of helping the consumption of book papers and restoring confidence to the users. We believe that these campaigns have and will greatly help the consumption of book and writing paper and get more business for the mills than they would otherwise get. We had several meetings with the Canadian Paper Trade Association during the year to discuss trade conditions and to try to get on a better footing. This spirit of co-operation is very much appreciated and is proving beneficial to all concerned.

During this past year business was very satisfactory when one considers the conditions that have been prevailing. The mills in this country have been very much better off than those in the other countries.

There is every indication that while there will be no great rush of business this year there will be a decided improvement over what we have had in the past year.

H. F. E. KENT,
Chairman.

(Reports of Sections to be concluded in next issue.)

The American Forestry Association, at its annual meeting in Washington last Thursday, adopted a resolution opposing the transfer of the forest service from the Department of Agriculture to the Department of the Interior. It was pointed out that such a move would mean duplication of effort and loss of efficiency. Other resolutions urged Congress to adopt a national forest policy law to improve fire prevention methods to increase research work and to provide additional national forests and forest lands.

You can't take a "short cut" on a straight road. You may take a "short cut" on a crooked road, but not on a straight one. This is the reason why there are no "short cuts" in the plan of salvation.

Technical Section

REVIEW OF RECENT LITERATURE.

E-4. Production of Bisulphite Cooking Liquor. Can. patent No. 213,360, The Brown Co., assignee of George Alvin Richter, both in Berlin, N.H., U.S.A., Sept. 13, 1921. Limestone is pulverized to pass through a 150 or 200 mesh sieve, and suspended in water. The limestone suspension is then treated either with sulphur dioxide gas or with sulphurous acid solution in excess of the amount required to form calcium bisulphite. Claims allowed 4. —A. P.-C.

E-4. Production of Bisulphite Cooking Liquor. Can. patent No. 213,361. The Brown Co., assignee of George Alvin Ritcher, both in Berlin, N. H., U. S. A., Sept. 13, 1921. Water and sulphur dioxide are passed through a series of towers in opposite directions, and at a given point in the system (neither at the beginning nor at the end) a lime bearing material is placed so that the acidulated water reacts with it to form calcium bisulphite solution, and the resulting solution is then still further acidulated. Claims allowed 6. —A. P.-C.

F-0. Straw Lignin Prepared by Treatment with Alkali Carbonate. F. Paschke. **Z. angew. Chem.**, xxxiv, 465, (1921); **J. Soc. Chem. Ind.**, xl, 732A, (Oct. 31, 1921). The lignin was prepared by treatment of the straw with alkali carbonate, precipitation from the extract with acid, and purification by repeated solution in alkali and re-precipitation with acid. The equivalent weight, determined by solution in excess of standard caustic soda solution and titration with phenolphthalein and methyl orange as indicators, with which lignin behaves similarly to carbon dioxide, has a value of 357. This is lower than that found by Beckmann for lignin from winter rye straw, viz., 462, but the high figure is due in part to colloidal lignin passing through the filter in the method he adopted. Elementary analysis of the straw lignin gave figures corresponding to an empirical formula of either $C_{27}H_{31}O_9$ or $C_{40}H_{45}O_{13}$ from which it is apparent that this lignin differs from Beckmann's essentially in its oxygen content, the formula assigned to Beckmann's product being $C_{40}H_{44}O_{15}$. The $C_{40}H_{45}O_{13}$ formula demands an equivalent weight of 366 which is in close agreement with that actually found.—A. P.-C.

G.-7; K.-7. Disc Refiner. Fr. patent No. 520, 875, Samuel Milne, England. **Papier**, xxiv, 452-453, (Oct. 1921).—A. P.-C.

G-8. Device for Cutting Fiber from the Formation Roll. Ger. patent No. 340,057. Strobelt. An automatic device for cutting the layer of fiber on the cylinder of a wet machine (formation roll) is described. As soon as the layer attains the requisite thickness a knife is released and drawn through the sheet.—H. E. W.

G.-11. Pulp Separator. Can. patent No. 213,124, Carroll Edward Carpenter, Hawkesbury, Ont., Canada, Aug. 30, 1921. Claim allowed 1.—A. P.-C.

G-12. Packing of Wood Pulp. Pappen u.Holzstoff Ztg., No 41, 1921 Owing to the high cost of freights and sacks mechanical woodpulp is preferably packed in the form of boards for shipments, although in this state it is not so well adapted for immediate use in the beater. On the other hand, packages are the simplest form. Methods of avoiding waste and adventitious moisture are also described.—P. B.

H.-4. Removal of Magnesium and Calcium from Rock Salt Brine (for Making Electrolytic Bleach). Can. patent No. 213,100, Francis Arthur Sandiway and Leslie Alexander Munro, Northwick, both of Chester, England, co-inventors, Aug. 30, 1921. After the addition of soda-ash and slacked lime to the brine, the latter is subjected to gentle agitation so as to change the physical condition of the precipitate and increase the rate of sedimentation. Claims allowed 5.—A. P.-C.

K-6. Preparation of Fiber from Typha. Paul Grabner. Ger. patent No. 339,978. The leaves are submerged in water and are allowed to disintegrate as much as possible in the absence of air.—H. E. W.

K-7. Beater with Several Bed Plates. Ger. patent No. 340,339, Reisten.—H. E. W.

H-4. Stable Bleaching Powder. Can. patent No. 213,573, Chemische Fabrik Griesheim Elekton, Frankfort on the Main, assignee of Heinrich Reitz, Bitterfeld, both in Germany, Sept. 27, 1921. The dry powder is mixed with dry kitchen salt free from impurities such as magnesium chloride. Claims allowed 4. A. P.-C.

K-7. Continuous Beating Engine. Can. patent No. 213,588, James T. Murphy and Edward J. Raney and James L. Carey, assignee of one-third of the interest, all of Chicago, Ill., U.S.A., Sept. 27, 1921. Claims allowed 18. A. P.-C.

K-7. Regulating Device for Beater Rolls. Can patent No. 212, 454, The Eastern Manufacturing Co., Boston, Mass., assignee of Archibald Ashbury Adams, South Brewer, Me., Both in the U.S.A., July 12, 1921. The beater is supplied with means for adjusting the distance between the roll and the bedplate and with an indicator for showing the distance between the two. Claims allowed 2.—A. P.-C.

K-7. Defibering Rags. Papier-Markt, Nos. 34 and 35, (Aug. 23 and 30, 1921). The fibers should be divided into their cellular elements, in which state they are of suitable dimensions for felting. This was formerly accomplished, and with excellent results, by the stamper, and its re-introduction into mill operations is not unlikely. Another method is described, a modification of the stamper, in which the rag fibers are suitably resolved into their elements by means of a hollander roll fitted with knives.—P.B.

K-12. Contrivance for Watermarking. C. E. JORNBERG. Ger. patent No. 336,855. This device is for use on a cylinder machine.—H. E. W.

K-12. Method of Felting Fibers on the Paper Machine. Can. patent No. 213,968, The Bagley and Sewall Co., assignee of Frank W. Monaghan, both of Watertown, N.Y., U.S.A., Oct. 25, 1921. The water and stock mixture is fed to the machine under sufficient pressure to cause them to form and maintain a reservoir or pool above the wire after the slice, in which pool the water and stock are agitated and move at a velocity approximately equal to that of the wire; and the wire takes water and stock from this pool to form the web. Claims allowed 13.—A. P.-C.

K-12. Paper Machine. Device for Felting the Fib-

ers on the Wire. Can. patent No. 213,969, The Bagley and Sewall Co., assignee of Frank W. Monaghan, both of Watertown, N.Y., U.S.A., Oct. 25, 1921. In a Fourdrinier paper machine, the combination with a slice or other controlling device and the making wire, of means for delivering the stock and water past the slice under pressure, and a resistance surface below the slice on to which the water and stock flow and form a pool from which the wire takes the water and stock to form the web. Claims allowed 10. A. P.-C.

K-12. Pulp Sheet Levelling Device for Paper Machines. Can. patent No. 212, 441, Charles R. Van de Carr Jr., Grand'Mere, Que., Canada, July 12,1921. The combination with a Fourdrinier paper machine of a jet distributing member connected to the head box and adapted for regulating the flow of pulp on the paper machine wire. The pulp sheet levelling device associated with the head box comprises a pair of plates adapted to extend across the side of the head box and having the lower ends adjustably spaced from the wire to form a pulp feeding orifice. Claims allowed 11.—A. P.-C.

K-18. Machine for the Manufacture of Embossed or Striped Cardboard. Fr. patent No. 524,743, Maurice Cartiaux and Charles Cartiaux, France. Papetrie, xliii, 938-940, (Oct. 25, 1921). The device consists of smooth cylinders between which the cardboard passes, and at least one grooved or engraved cylinder which may be brought up against the smooth cylinders or removed from them according as its action is or is not required. —A. P.-C.

K-23. Paper Reinforcing Machine. Fr. patent No. 520, 693, Patrick Tracy Jackson, U.S.A., Feb. 19, 1921. **Papier**, xxiv, 397-404, (Sept. 1921).—A. P.-C.

K-O. Batic Effect on Paper. Ger. patent No. 339,-606, Meister, Lucius and Bruning. Addition to Ger. patent No. 338,105. Covers the use of caustic liquors as solvents.—H. E. W.

K-23. Safety Paper. Ger. patent No. 337,818, Class 55f, ALFRED STRUM and Veifa Werke Vereinigte Electrotechnische Institute Frankfurt Aschaffenburg m.b.H. Colorless solutions of the salts of heavy metals which absorb X-rays are printed in certain designs on paper. The paper is tested against a light screen. The criminal must know what are the ingredients of the printing solution and how they the compounded. — H. E. W.

K-23. Weather Proof Paper. MAX ROGLER, Dusseldorf-Gerresheim, Ger. patent No. 337,769, Class 55f. An emulsion is prepared from 1000 parts olein, turkey red oil, or other saponifiable fat or resin and 50°Be caustic in 2000 parts of water, 2000 parts stearin pitch, and 500 parts of paraffin. Alcohol, amyl alcohol or phenol hasten the solvent action. The emulsion is added to the stock in the beater. Salt is added to aid in salting out. Sugar of lead is then added until the water in the beater is clear. Paper is then made of the stock. Petroleum pitch is mentioned and also coal tar pitch.—H. E. W.

K-0. The Standardization of Paper. FRED A. CURTIS, Chief of Paper Section, Bureau of Standards, Washington. **Paper,** xxix, 20-22, (Oct. 26, 1921); **Paper Trade J.,** lxxiii, 28, (Oct. 27, 1921). An address on the work of the Bureau of Standards in establishing standards for paper. Eighty different sizes of envelopes in a Government contract were eliminated.—H. E. W.

L-4. Flange Tubes of Paper. Ger. patent No. 329,-154, Continentale Isola Werke Akt. Ges.—H. E. W.

L-4. Device for Preparing Endless Paper Tubes. Asthest und Gummiwerke Alfred Calmon Akt. Ges., Hamburg. German patent No. 329,446. -H. E. W.

L-4. Cardboard Receptacle. Can. patent No. 192,619, The Cedaroid Company, Inc., assignee of Peter J. Nagle, both of Rochester, N.Y., U.S.A., Sept. 9, 1919. Claims allowed 5.—A. P.-C.

L-4. Window Envelope Making Machine. Can patent No. 212, 859, John Paterson Ramage, Liberton, Midlothian, Scotland, Aug. 9, 1921. Claims allowed 6. —A. P.-C.

L-4. Reusable envelope. FREISE, Ger. patent No. 327,587. **Papier Ztg.**, xlvi, 2833, (Aug. 9, 1921). The adhesive is placed on the flap of the envelope as well as at the opening.—H.E.W.

L-4. Clip for Strengthening Cardboard Boxes. Can. patent No. 213,682. The Eaton, Crane and Pike Co., assignee of William Allen Pike, both of Pittsfield, Mass. U.S.A., Oct. 4, 1921. Claims allowed 3. A. P.-C.

L-5. Cellulose Acetate Insoluble in Chloroform and Process of Making Same. Can. patents No. 191,800, 191,801, 191,802, HENRY DREYFUS, London, England, July 29, 1919. Claims allowed 5, 13 and 13, respectively.—A. P.-C.

L-7. Cellulose Yarn Spinning Machine. Ger. patent No. 338,993. The patent covers a device for converting narrow strips of paper into yarn for spinning. —H. E. W.

L-5. Precipitation of Cellulose from Viscose Solution. Ger. patent No. 339,050, Class 29b.—H. E. W.

L-5. Artificial Silk. Chemische Werke vorm Auergesellschaft, Ger. patent No. 338,653, Class 8m.—H. E. W.

L-7. Process for Spinning Short Fibres. G er. patent No. 312,400, Class 76c, Group 29, **Papier-Fabr.**, xix, 850, (Aug. 12, 1921). The short fibers are converted into paper and then the paper is converted into ribbons and worked up in the usual way. The paper is so made that it is loose and porous. The water is removed by the application of only a slight amount of suction. The paper may be creped, picked or treated with swelling agents.—H.E.W.

L-7. Process for Making Fiber from Reeds. EMIL CLAVIEZ, Ger patent No. 339,270, Class 29a. The reed after being crushed in warm water is subjected to the action of soap or other softening material. The fibers obtained may be incorporated with cotton and spun.—H. E. W.

L-8. Defective Printing on Porous Paper and Cardboard. Papier Markt. No. 20. 1920. In the use of carbon black as well as of pure colors it sometimes happens that in spite of all known methods of preventing it the ink or tones do not print satisfactorily, that is, become blurred or smudged. The defect is usually attributed to the color, but a careful examination of the paper or cardboard will show that the surface is either too porous or too rough. Two methods are suggested for overcoming the trouble: careful preliminary calendering of the rough surface, or, in the case the paper is too porous, the spaces may be caused to coalesce and close the insterstices by a slight moistening of the sheet.— P. B.

L-0. Luminous Writing Tablet. PREUSSNER and RICHTER, Ger. patent No. 328,140, Class 70d. **Papier Ztg.**, xlvi, 2803, (1921). A tablet suitable for taking down notes, which can be read in the dark is described. It contains a washable plate upon which the writing is done and on the reverse side of which is a layer of luminiferous material.—H.E.W.

British Trade News

(From Our London Correspondent.)

The question of standardisation of papers is dealt with by Messrs. Strong, Hanbury & Co., Ltd., in their paper "Paper & Progress," which they publish for their employees and customers. The suject is an old one and revived at intervals at many gatherings in London and elsewhere. Messrs. Strong, Hanbury & Co., say their view has been, and still is, that the business of the wholesale stationer is to supply the requirements and demands of his customers. Special weights and sizes have, of course, for long been made to order, but for stocks to be held of any such weights and sizes, with only the barest possibility of anything but the most occasional enquiry for them, is scarcely a proposition worth consideration, even as an experiment. While they would like to see standardisation of sizes of paper, they feel that to get the standard number of sheets and weight settled first would be a step in the right direction and more imperative.

Big Drop in Pulp Imports and British Exports.

Preliminary figures have been issued on the trade of 1921 and they make deplorable reading on the state of the British paper exports. Owing to the detail's not being circulated yet, it is easy to surmise the position Canada occupies in the pulp imports, but I gather from the post weekly statements that it will be a conspicious one. Roughly the imports were as follows in 1921, compared with previous years:—

Imports.	Paper cwts.	Pulp-Tons.
1921	736,165	77,672
1920	674,903	88,687
1913	1,087,918	109,019
Exports	Paper cwts.	Rags, etc-Tons
1921	139,358	13,274
1920	241,227	5,325
1913	258,431	17,881

These figures show the enormous decline in pulp imports and paper shipped out of the country. Indeed 1921 has been one of the most deplorable years experienced for a long time by the paper makers.

Messrs. Alex. Pirie & Sons, Ltd., one of the Scotch manufacturers, in a review of 1921, say that the excess of prosperity in 1920 reacted disastrously in 1921, for the inevitable slump which everyone should have forecasted, but which hardly anyone did, left all users of paper with very abnormal stocks, which have been in many cases, not yet sufficiently worked off. The unsettled state of prices, both of raw materials and of the finished goods, has left buyers in a very timid mood, and purchases have been, for the most part, from hand to mouth. Added to this is the fact that paper, unlike food, is an article that may be bought or left alone, and many suffering from lack of employment have been content to go without supplies of paper. This may be said to be the situation at home. Abroad, in addition to the foregoing causes, the disastrous state of the Exchange in most countries has closed the door to importation of British Goods. The only part of the world that may seem to offer hope in the near future is North America, as the demand appears to be once move going strong in that particular quarter. Most British Mills have been fortunate if they have worked half-time for the greater part of the year. At the moment trade looks as if it will brighten up, and everyone is meantime holding back in the hope that the situation will by then have become sufficiently clear to make a forward movement possible. While it is too early to predict the time when mills be running at normal again, there is a chance that by the end of the Spring things will have improved sufficiently abroad to reinforce the improved demand which seems about to set in at home.

Newsprint Prices.

It may interest some Canadian newsprint producers to know that Messrs. A. Connolly & Co., 317 High Holborn, London, are offering to newspaper publishers and others newsprint at the following prices (delivered to any printing works in the United Kingdom): Diameter of reels 28in and 30in, 500 demy=14-15 lb.,bore 2 3-4 inch: 50tons 17inch, 65 tons 18 inch, 20 tons, 20 1-4 inch, 50 tons 35 1-2 inch, 25 tons 40 inch, 38 tons 40 1-2 inch, 125 tons, 41 inch reels at £17.10s. (roughly $84) a ton net.; also, 140 tons, 34 3-4 inch reels and 140 tons 69 1-2 inch reels at £16 (roughly $76) per ton f.o.b. London. I give these prices to show how newsprint is disposed in London. British newsprint is selling up to 5 cents a lb. less 2 1-2 p.c. Indeed, it is a policy of "get what you can" as the shortage of orders is harassing many manufacturers just at the moment.

The Esparto Combine.

The Esparto mills in the new combine number about 10 and Sir Frederick Becker is the chairman.

By the way, one of the London daily papers commenting on Sir Fred's new year honour said: "He is one of the tallest and most powerfully built of all the business men I know. He owns or controls many paper mills, the most northernly being that on Don Side, near Aberdeen, where during the war, he introduced the method of making paper from sawdust.

Export trade will receive serious attention from the Esparto Combine. Esparto printing paper is about 10 cents and writing paper is as low as 9 cents in London. Alexander Pirie & Sons, Ltd., and Thomas Tait & Sons, Ltd., are not in it. These are very prosperous mills in Scotland and have a fine reputation.

Pulp Prices Hardening.

For sellers of pulps there is a ray of sunshine through the dark clouds that have been overhanging the industry for some months past. There is an optimistic feeling prevailinf, caused by enquiries, which may be taken as a sign that the time for buying in fast approaching. Prices are hardening, as a consequence, which is another sign that there is "something doing." And rumours are current that groundwood is scarce with a good demand. Prices may roughly be quoted as follows in London:

Bleached sulphite £22-£23½; Easy Bleaching, £16-£17; Sulphite newsprint (No. 1), £15; Unbleached soda (No. 1), £13½; Soda kraft, (unbleached) £13½-£14; groundwood (wet) £5¼; groundwood (dry), £10½.

Pulp for America Bulges Ship.

In the river Clyde (Scotland) there is the steamer "Roomsdalsharn" with bulged plates. Her cargo of 6,000 tons of wood pulp for America from Norway got wet, swelled in the holds, and caused more leakage by the damage done to the plates. Clyde repairers have now the ship in hand.

Notelets.

Groundwood (wet) is still quoted £5. 12s. bd. in London.

It is reported in London that Finland and Germany have been sold out of pulp.

A cargo of 2,805 tons of unbleached chemical pulp (Dry) is reported by the customs to have arrived from Canada.

Mills are well stocked with chemical pulps in England.

SURVEY OF BRITISH CONDITIONS.

Canadian manufacturers, and others, will be interested in the following survey of present conditions in the paper market of the United Kingdom which appeared in "The Newspaper World" of January 28th.

"The Newspaper World" is published for the benefit of newspaper publishers of Great Britain, so that its views with regard to the paper market cannot be said to be biased in favor of the producer.

The article is as follows:—

A much more hopeful strain porvades the paper market than has been noticeable for some time past. An encouraging sign, though perhaps one which is a trifle disconcerning to those buyers who have during the period of falling prices drifted into the habit of not ordering paper until the very last moment, is that mills are asking rather longer for delivery of special making orders than they did three or four months ago. Prices have in all probability reached their bottom level, and any sudden influx of orders would cause an immediate rise. Big buyers are watching the trend of things very carefully, and as soon as there is the least tendency for prices to harden they will begin to give out orders with a fairly free hand. It is very evident, from the hand to mouth way in which big firms have bought for some time past, that printers' stocks are about as low as they can safely be, much lower than most of them care to acknowledge or than they would consider wise in normal circumstances. Business has been bad all round and big printing orders have been scarce, and the competition for those that have been given out has been so keen that printers have not cared to chance further losses by the depreciation of paper stocks bought simply to fill up the warehouse. It would, however, appear to be a much wiser plan, now that paper prices have dropped so low, to replenish stock carefully to a moderate extent rather than to wait until business generally revives and everyone is giving out orders and pressing for deliveries at the same time.

The troubles of the past few years have been largely caused by panic buying and not from legitimate causes of really increased demands. Two years ago prices were about fifty per cent. higher than they are now, but since then they have risen to three hundred per cent. over the present and come back to their present level. Because printers were very full of work their customers imagined that they would not be able to get what they wanted, and so to safeguard themselves ordered, in some cases, twice as much as they wanted and pressed for delivery. The printer and paper consumer, finding that prices were rising and that longer time was wanted for delivery, increased their orders and gave further large orders for future delivery and loaded themselves up with stock to a much greater extent than their normal business requirements warranted. The more they ordered and pressed for delivery the higher the prices went.

This sort of thing is not likely ever again to repeat itself, but with warehouses so empty of ordinary everyday stock, as they are now, there will be a great temptation, as soon as it is quite certain that the bottom of the slump has been reached, to order more freely than is perhaps wise. Only the other day a buyer remarked that if he were sure prices were going to harden, even very slightly, he would order pretty freely.

The Board of Trade returns for exports and imports for 1921 which have just been published, show very clearly how things have been going with the paper trade. The total quantity of raw materials imported is just about one half of the tonnage received in the previous year, and as an indication of the high price that paper makers have paid for their wood pulps the value is also just about in the same proportion. Seeing that during that period the market prices for these materials had dropped to about one third of what they were in 1920, this speaks volumes.

In an analysis of this part of the returns it is interesting to note that the imports of mechanical pulp from Canada were 50 per cent. more in 1921 than in the previous year. It is hoped that in the years which are coming more and more of our raw materials for paper-making will come from this part of our Empire, so that we may become gradually more independent of foreign sources. With respect to the imports of manufactured paper, here, again the proportion is nearly the same, 6,800,000 cwts. against 12,900,000 cwts. in the previous year. It is interesting to note that with all the show and competition which German mills have made in this country during 1921, the actual weight of paper received from them has been only 279,000 cwts. against 429,000 cwts. in 1920.

NAME of EDDY HONORED at McGILL.

"The Mrs. E. B. Eddy Chair of Industrial Chemistry" is the title of a new foundation at McGill University. This matter was settled when the Corporation received the report of the Principal, Sir Arthur Currie, announcing the approval of the board of governors of the proposal to establish such a chair of teaching.

By the will of the late Mrs. E. B. Eddy, a bequest was made to McGill University with a proviso that the money should be used for the establishment of chairs. This is the first foundation to be approved of in connection with the bequest.

According to the plans for the new chair, the holders of the professorship will devote special attention to wood chemistry. As the Eddy family has been concerned in a large way with the forest products of Canada, both in lumbering and in manufacturing, it is particularly appropriate that the bequest should be used to further encourage the study of what has become a most important branch of chemistry in the Dominion. The development of the lumber, pulp and paper industries and the necessity of conservation of Canadian forests have increased the demand for men thoroughly versed in the scientific aspect of these important matters, so that the new chair should prove an important addition to the already excellent facilities in the teaching of the sciences at McGill.

ABITIBI SETS NEW PRODUCTION RECORDS.

New production records have been established in the Iroquois Falls paper mill of the Abitibi Power & Paper Company during the past two or three weeks. The latest production returns show an average output of 455.38 tons per day, compared with 449.12 tons per day for the week ending January 31. This is equivalent to an operating efficiency of 93.6 per cent for all machines for the week. The individual daily record for the mill was also surpassed on Friday, February 3, with 470.33 tons, equal to an average efficiency of 96.1 per cent. This week's run is higher than any week during 1920 by 141 tons, and is a good start for the year 1922.

Mr. Geo. Ridley, secretary to Peter Dixon & Son, Ltd., Oughtibridge, has died. He spent all his life with Dixon's and no one feels his death more than Mr. Joseph Dixon the head of the firm.

UNITED STATES NOTES

It was announced last week in Washington that the new paper division of the Bureau of Foreign and Domestic Commerce is to be in charge of Grosvenor M. Jones. Mr. Jones, who has been indentified with the paper trade and industry in official as well as unofficial capacities, was formerly an assistant director in the Bureau. He has traveled extensively, is the author of some well known reports on shipping and related subjects and he has been indentified with the Mercantile Bank of the Americas as an executive and foreign branch manager. Mr. Jones in 1913, before entering the service of the Bureau of Foreign and Domestic Commerce, carried on a special investigation in Washington in behalf of the American Paper and Pulp Association. He is a graduate of Georgetown University, and also attended Harvard University.

The annual meeting and luncheon of the Association of American Wood Pulp Importers held in New York City a week ago, brought together nearly the entire membership. The Borregaard Company, Inc., and N. R. Johaneson & Co., were admitted as new members of the association. Officers elected for the ensuing year are the following: Sigmund Goldman, president; Frank C. Overton, vice-president; Lee Bowmall, secretary, and Alton Faunce, treasurer.

Statistics on lumber and forest product output for the year 1921 are to be gathered jointly by the Bureau of Cencus and the Forest Service of the United States Department of Agriculture. This data is to be part of the census on manufactures. The agreement for conducting this research contemplates the utilization of the Forest Service organization in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington and Wyoming. Forest Service men will be sworn in as census agents in the West, acting under authority of the Census law. By this means duplication of inquiries will be avoided.

Unusual safety records have been made in the plants of two big Wisconsin paper manufacturers during last year. In the four plants of the Consolidated Water Power and Paper Company, statistics compiled by the company show that not a single fatality had taken place in the last twelve months. This splendid record was made while the company was employing the largest force in its history. The concern has been carrying on a systematic safety campaign throughout the year. At the plant of the Marinette and Menominee Paper Company, the sulphite department ran 387 days without an accident that caused the loss of more time than a full work-day. The department employs 46 men and it was computed that the mill operated 19.252 man-days without an accident. This record is said to compare favorably with the best in any industry.

TO MAKE PULP STONE BURRS.

The International Burr Company of Watertown,N.Y., will be the seventh new industry to locate at Belleville, Ont., within a year. The product of the plant is largely used in pulp and paper mills.

AMERICAN PAPER AND PULP ASSOCIATION—April 10-15.

New York, Feb. 9.—The official call was sent out today for the forty-fifth annual convention of the American Paper and Pulp and affiliated associations at the Waldof-Astoria, New York, the week beginning April 10. Several of the meetings of the affiliated associations have been tentatively schedule, and there is every prospect of a record-breaking attendance. In fact, the preliminary announcement contain a caution that it may be necessary to limit the number of guests allowed each member, though members of the Association, will, of course, be given preference.

Applications for reservations are already being received at the offices of the American Paper and Pulp Association, and all requests for reservations must reach the office not later than Wednesday April 5.

The dates for the meeting of the American Paper and Pulp Association have been definitely fixed, while the meetings scheduled by the affiliated associations are tentative, but will probably be unchanged in most cases. The list as at present follows:

Tuesday, April 11, 1922.

10.00 A.M.	Glassine & Greaseproof Mfrs. Ass'n.
10.00 A.M.	Book Paper Manufacturers Ass'n.
10.30 A.M.	Salesmen's Ass'n. of the Pa. Industry.
2.00 P.M.	Vegetable Parchment Mfrs. Ass'n.
2.00 P.M.	Salesmen's Ass'n. of the Pa. Industry.
7.00 P.M.	Annual Banquet-Salesmen's Association.

Wednesday, April 12, 1922.

10.00 A.M.	Waxed Paper Manufacturers Association.
10.00 A.M.	Writing Paper Manufacturers Ass'n.
2.00 P.M.	Sulphite Bond Division.
	National Paper Trade Association meetings and banquet.

Thursday, April 13, 1922.

10.00 A.M.	Annual Meeting, American Pa. & Pu. Ass'n.
2.00 P.M.	Annual Meeting, American Pa. & Pu. Ass'n.
7.00 P.M.	Annual Banquet, American Pa. & Pu. Ass'n.

Friday, April 14, 1922.

11.00 A.M.	Toilet Paper Converters Association.
2.30 P.M.	Tissue Paper Manufacturers Ass'n.
6.00 P.M.	Tissue Paper Manufacturers and Toilet Paper Converters Association Annual Dinner.

Note.—Dates for meetings of carboard, glazed & fancy, gummed, binders board, pulp and wrapping associations and T. A. P. P. I. will be announced later.

Friday meetings will be at the Hotel Astor, others at the Waldorf—Astoria.

10—YEAR PULP CONTRACT.

It is stated that an announcement will be made shortly in connection with the Saguenay Pulp and Paper Company, said to be the largest in the world, for the completion of a contract for the sale of the Company's present output for a period of ten years, on the basis of cost plus an additional amount per ton.

PULP AND PAPER NEWS

Toronto, February 11th, 1922.— So many million words, so many thousand pages of type, such is the meal for timber commission to digest. Hearings are finished and now remains the question of who gets honorable mention.

In the coming session of the Ontario House one of the important matters will be the disposition of timber lands. The claim is made that the action of the Drury Government has saved the Province upwards of a million dollars by making lease-holders on limits pay up arrears that the former Government had failed to collect. The attidude of the opposition will be a 'tu quoque,' claiming that the Government has sold leases against the interests of the Province. This will furnish some personal pyrotechnics.

There is general satisfaction that in the choice of Mr. P. C. Larkin for Canadian High Commissionership at London, a thoroughly representative business man, rather than a politician, has been selected. This should ensure the cultivation of better relations with the paper trade of the United Kingdom.

General conditions continue to be steadily improving. We have before us reports from pulp, news and book mills mentioning new production records and capacity operation. These may be exceptional or not but the words fall like water on parched ground.

One paper stock man speaking of book stock said, if he could carry on without doing so, he wouldn't sell a car load of higher grade stock. He has been bullish for some weeks basing his views on the difficulty of securing consignments in any quantity.

Premier Drury, his cabinet, Mayor Edmeston of Fort William, the council of that city, and representatives of the Great Lakes Pulp and Paper Company, met recently. It is expected that the outcome of the meeting will be inauguration of a new pulp and paper industry for Fort William.

Our congratulations and best wishes to Mr. Manley Chew M. P. of Fibre Board Ltd., Midland, who is shortly to marry Miss Marjorie Byrne of that town.

The St. John N. B. Commercial Club was reorganized last month, with Major R. A. McAvity as president, and H. V. MacKinnon, as secretary.

L. S. Burden, until recently manager of the Pacific Mills at Ocean Falls, has been appointed to the office of manager for coast at Vancouver in succession to A. B. Martin, who goes to San Francisco to a more important post on the board of directors. Mr. Burden returned to Ocean Falls from Vancouver on January 17 and about February 1 will be moving to Vancouver with his family to take up his new duties. Mr. Mulkey, who has been accountant at Ocean Falls, will succeed Mr. Burden as resident manager. Mr. Burden has been at Ocean Falls for six years ever since the plant was first started, and his departure will be generally regretted. Mr. Martin was also formerly at Ocean Falls and was resident manager before Mr. Burden.

The Whalen Pulp and Paper Company's shingle, lumber and pulp mill at Swanson Bay is again running full blast, and two shifts are working daily. The plant is said to be turning out a better grade of pulp than ever. F. C. Bennett is manager in charge of operations and J. Hennessey is the mill superintendent. Pulp is being shipped from the plant to New York on the Robert Dollar boats via the Panama Canal.

PROVINCIAL PAPER IN STRONG POSITION.

Notwithstanding the difficulties of the adjustment year which led to a radical decline in the demand for products of the pulp and paper mills, the Provincial Paper Mills, Ltd., was able to show a substantial surplus of earnings after all charges, and a material strengthening of its cash position.

Profits for the year are lower, a situation not unexpected, and stood at $728,774, as compared with $1,225,775 for the banner year of 1920. After all expenses and applying the sum of $210,000 to reserve for depreciation, $119,000 in preferred and $245,000 in common dividends, there was a surplus of $153,844, as the previous year.

Assets show a slight increase in value and stand at $7,611,568, as compared with $7,565,617. Real estate, equipment, etc., are valued at $5,306.408, as against $4,952,681. Current assets at $1,443,778, compared with current liabilities of $476,159. Accounts receivable total $663,680, as against accounts payable of $393,326. The inventory at $809,826 has been taken, it is understood, at December 31 cost prices. The reserve for depreciation now stands at $593,161, as against $443,161, and the balance at profit and loss at $787,247, compared with $633,403.

While mill operations during 1921 were interrupted by the declining demand for pulp products, Secretary S. F. Duncan reports that the plants are now operating at capacity. The outlook for the year, judged by developments to date, he adds, is encouraging. During the month of January more orders were placed with the company and more inquiries received than for any period of 1921, thus indicating the possibilty of an enlarged consumption of paper.

CUT IN LUMBER CUT CUTS REVENUE.

New Brunswick citizens are faced with the unpleasant prospect of providing some new revenue for the Provincial Treasury.

The depression in the lumber business during the past year has caused a falling off of more than half a million dollars in the annual provincial revenue from stumpage on lumber cut upon the Crown lands.

Thus the principal sources of the province's revenue have been seriously menaced, and the problem that faces Hon. Walter E. Foster, the Provincial Premier, and his government is what method of raising revenue should be adopted. It is expected that the formulation of the new scheme, whatever it is to be, will be completed before the Provincial Legislature meets, in February or the first week in March, and that the lawmakers will be asked to pass a measure embodying the proposals.

Iroquois Falls had 39 inches of snow in December, the record since the mill was built.

CANADIAN TRADE CONDITIONS.

Montreal, February 14.—Conditions in the pulp and paper trades, as a rule, change very slowly. At this period of the year the paper jobbing business is usually quiet, and this is the present position. Jobbers have by no means ample stocks — they are buying in the same way as their customers are, for immediate needs. The fact is, general trade is not brisk; and until there is a little more activity, the paper business will remain in the same position.

A Montreal representative who has just returned from the maritime provinces reports trade dull and a disposition to cut prices in order to secure whatever orders are going.

Locally, the mills have a satisfactory volume of orders for book and fine papers. There is a small supply of rags, with a limited demand, while waste paper is by no means abundant. Newsprint is maintaining its improvement.

While the call for ground wood is slow, the business in bleached sulphite is on the up-grade.

The news from London that there is a probability of Canada and Australia renewing negotiations for a tariff treaty is of great importance to our paper industry. The last negotiations apparently broke down because of the inability of the two Governments to to make mutual concessions. Australia, it is understood, wanted certain preferences for her agricultural products. Canadian mills have done a large business with Australia, but owing to the tremendous competition the volume has been reduced. It is asserted that British and European firms are selling below cost. Canada is under a serious disadvantage as regards newsprint, in that she is, for customs purposes, regarded as a foreign nation, while Great Britain has a preference. The Canadian Government has protested against this discrimination, but without result. Sir Joseph Cook, the Australian High Commissioner in London, is of opinion that "the time is now ripe for a real effort to be made to adjust the financial differences between Canada and Australia." The Canadian Government will no doubt accept this invitation to renew negotiations. In view of former experiences, the paper interests may be depended upon to do their best to secure in any negotiations, an arrangement which will benefit the trade and be fair to industries.

Mr. Norman Wainwright, Montreal, will leave for Lohdon, England, early in March, for the purpose of opening an office for the Provincial Mills, Limited. This office will deal not only with trade with the United Kingdom, but will also handle export business with other countries. London is the centre of the world's export trade, and the new facilities of the Provinvcial Mills, Limited, will no boubt assist this department of their operations.

As Toronto Sees It.

A renewal of activity in the Pulp and Paper Industry which was expected to take place early in the new year, has not occured with sufficient strength to worry anybody with regard to the filling of orders. There is however, a strong undertone which indicates that prices are on a firm basis. There is, perhaps, some consolation in the present hand to mouth method of doing business and possibly a lesson to be learned in so far as the total volume on orders passing indicates just about the total current consumption and as this is keeping the mills reasonably well engaged, it can be seen that any increase in demand by consumers or any tendency to order for stock, will have an immediate and beneficial effect on the trade.

PULPWOOD.— There is litttle if any activity in this market, the prices asked depend on the need of money on the part of holders of wood and on the freight rates from point of shipment. There are instances where wood has been sold at the railroad for as low as $5.00 but this of course, cannot be taken as indicating a market price because wood is worth at least half that on the stump.

WOODPULP.— There have been few transactions of groundwood for spot sale. It is reported that stored pulp commands around $30 and therefore, ground pulp about $10 higher depending on quality. In sulphite pulps, unbleached ranges from $65 to $75 per ton delivered while bleached pulp commands from $ 100 to $ 105 delivered though a few instances are heard of where lower prices have been received.

BOOK AND WRAPPING.— Prices are firm and some mills report a very satisfactory condition as regards orders. One mill making Bristols etc., reports a gradually increasing business with orders ahead in all their lines.

NEW YORK MARKETS.

New York, Feb. 11—(Special Correspondence)—Judging from the many reports received, demand for most kinds of paper has undergone what could be correctly called a slump. This is probably a strange assertion to make, particularly when everyone connected with the paper trade has for some time past been of the belief that the market would take a decided brace for the better toward the end of January and during the early part of February, yet it is plainly to be seen that the market is at least a bit quieter at the moment than it was up to a few days ago, and the only description to properly fit the prevailing situation is to say that demand has slumped.

There is no denying that the paper industry as a whole is gradually though steadily working into a stronger and healthier statistical position and that the fundamental condition of the market at present is substantially improved over that of several months ago or prior to the broadening of trade activity along about October. Nevertheless it would appear that there has been something of a reaction in demand for a majority of grades of paper during the last few days, and, coming at just the time when nearly everyone in the trade confidently looked for much improvement in business, the quietness has been a great deal more accentuated than it probably would otherwise have been . The slowing down of demand seems entirely due to matters affecting consuming markets. Consumers of paper are noticeably limiting their cur-

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re purchases of paper to a minimum and seem altogether indisposed to buy unless having immediate need for supplies. Jobbers in turn are keeping stocks down at as low a point as they can afford to, and the net result is that paper mills the country over are seriously in want of business. Reports from manufacturing centres, to say the least, are far from encouraging, telling as they do of this or that paper mill operating at but a small percentage of capacity and with manufacturers openly complaining of the lack of profit in producing paper to sell at prevailing market prices.

Possibly much of the discomfort felt regarding the present situation is caused by disappointment over the market not opening up in the fashion that it was expected to about this time. Business in paper, of course, is not down "in the dumps," nor are conditions so bad that sales cannot be made, but there is no gainsaying that demand is limited and that manufacturers and jobbers are competing for business in such a way as to make for district easiness in prices. There seems to be always some mill ready to grant price concessions if by doing so an order for paper can be secured, and it is this keen competition for such business as is available that makes matters as unfavorable as they are.

Newsprint seems to be in about as steady a position as any other grade of paper, and yet the newsprint market lacks strength. Mills probably are running at a better rate of capacity than other paper mills; notwithstanding manufacturers say they are producing print paper at today's market prices at a considerable loss to themselves owing to the high-priced wood they are running on at present. Newsprint consumption keeps up at a good rate and is surely increasing, though slowly. One only has to watch the New York dailies to see that advertising is on the rise and that publishers of newspapers are therefore printing larger issues, which of course means larger consumption of newsprint. At the same time prices on newsprint are merely holding their own. It is stated on high authority that most spot sales are being made at no better than the contract basis, namely $70 per ton at mills for roll news, and in some cases it is said mills are accepting orders from transient buyers at even less than the contract price.

Demand for wrapping paper has slowed down to a pronounced extent. Those mills which up to a short time ago were reported booked fairly well ahead on orders now seem to have filled commitments, and reports say that additional orders are extremely difficult to procure. Leading domestic producers of kraft wrapping papers continue to quote 7.50 cents a pound on No. 1 domestic kraft, yet sales are being made at considerable under this level, it is said. Tissues are in a slow market position, especially fine grade tissues, and quotations display a weakening tendency. Book papers are easy. Mills in the Middle West are delivering machine finished book paper into New York at 5.75 cents a pound, and jobbers report buying in some cases at a triffle below this basis. Fine papers are moving in but routine amounts with little or no snap to the demand, though quotations are maintained. Box boards are showing slightly more life and are steady in price, news board being quoted by eastern mills at $40 to $45 per ton f.o.b. New York, and plain chip board at $37.50 to $40 a ton.

GROUND WOOD—Demand for mechanical pulp has subsided to a very marked degree during the last few days and the market is in a quieter condition than in some time. Paper and board manufacturers apparently have let up in their buying because of dullness in their own trade, and while quotations are unchanged, there is a downward tendency in evidence. Current prices on prime spruce ground wood figure out at between $40 and $42 per ton delivered consuming mills in the United States, with the f.o.b. producing point quotations ranging anywheres from $27 up to $34 a ton, depending on the location of the grinding plant, the lower prices applying to ground wood brought in Canada.

CHEMICAL PULP—There is a lack of important trade activity in chemical wood pulp. Consumers are buying in smaller tonnage than for some time and the tendency of prices is unmistakably toward lower levels although no actual changes have yet taken place. Sulphite seem relatively firmer than other grades of pulp. Producers of bleached sulphite are maintaining quotations though it is stated they are obtaining but little business at the basis quoted, namely, 5.00 cents a pound at pulp mills for No. 1 quality bleached. News grade sulphite is moving in fair amounts at prices ranging around 2.50 cents per pound at pulp mills. Kraft appears to be easing though quotations hold at between 2.75 and 3 cents a pound on both domestic and Scandinavian kraft.

OLD ROPE AND BAGGING—Both old rope and scrap bagging rule steady at last reported prices. Domestic manilla rope in No. 1 condition is bringing 4.50 cents per pound at dealers shipping points, and No. 1 scrap burlap from 90 cents to $1 per hundred pounds.

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Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. **GARDENVALE, P. Q., February 23, 1922.** No. 8.

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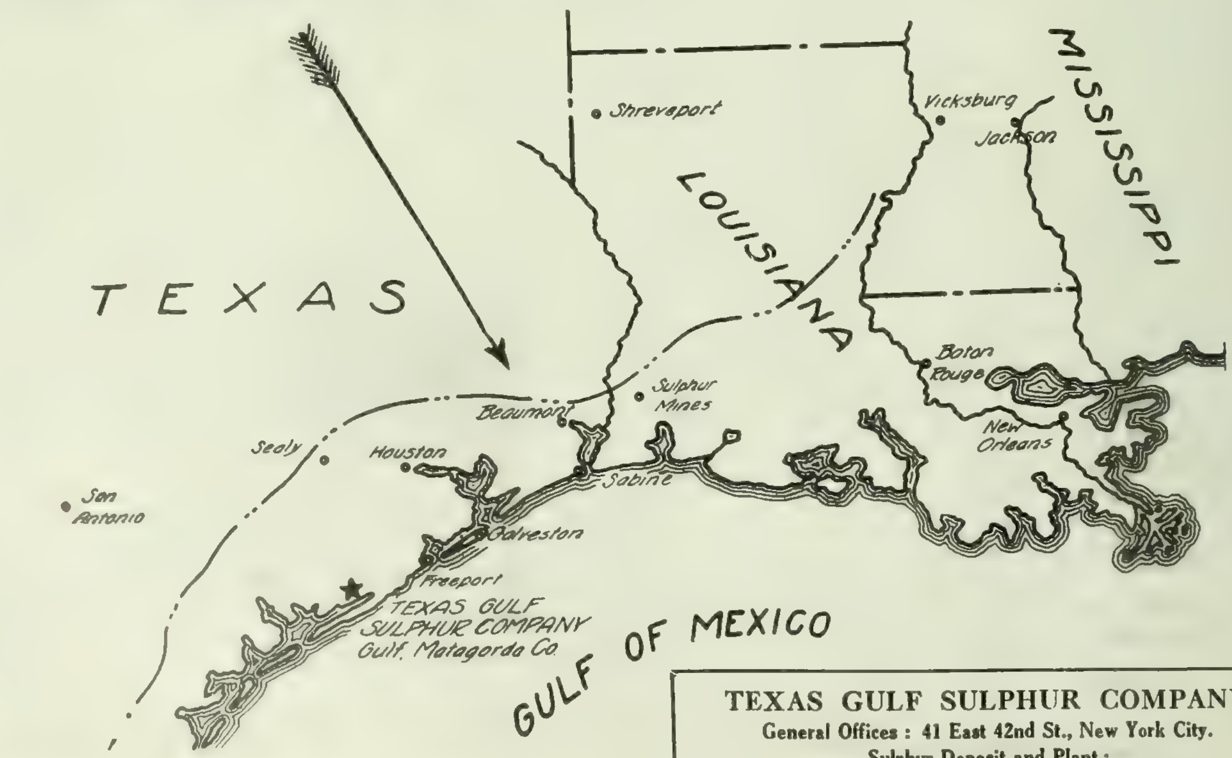

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EDITORIAL

HAND TO MOUTH BUYING.

Considerable emphasis is laid by most trade and commercial papers on the increased activity that will come to manufacturing plants when once the jobber acquires sufficient confidence to purchase materials for stock. It is generally recognized that at the present time jobbers and wholesalers in practically every line are purchasing only in such quantities as may be required to fill the immediate needs of their customers. Retailers, too, are following the same plan and with mills making only on order, we find that there is very little available stock of most products on hand. Such a method of doing business, when each one applies it to himself alone, would probably be considered as quite sensible, safe and satisfactory. Nobody wants to tie up a lot of money in manufactured goods or, for that matter in raw materials either. He is usually quite willing however, to advise his customer to buy in large quantities. There are two occasions when such purchases are particularly advantageous, either when the larger manufacturing order will make the cost of production per unit materially less or when there is imminent an appreciable rise in the cost of the material in question.

About the only serious disadvantage we can see in purchasing very far ahead, other than missing out on the two points just mentioned, is that there may be a sudden increased demand for goods which may come at a time when the jobber is not prepared to fill orders promptly and thus lose out to one who is more fully stocked. There have been both large losses and large profits made by carrying large stocks of goods and this applies to other lines as well as to pulp and paper. There is also a chance of deterioration in quality of certain lines although most papers remain unchanged during long periods of storage.

It seems to us, and if our readers differ with our opinion it will be a pleasure to have them express their views, that the so called hand to mouth buying is to be regretted rather for the inconvenience and expense of handling small orders and manufacturing small lots of paper than to any great influence on the total quantity manufactured. It undoubtedly does increase selling costs. On the other hand we believe it better to have the general practice of purchasing but little ahead of requirements so as to maintain a fair rate of turn over and then gradually increase the size of individual orders as demands for paper increase and it becomes worth while and safe to stock larger quantities of standard grades than it would be to have any sudden extension of ordering for stock only to revert again to small orders for replacing stock if the larger ultimate movement to the consumer did not take place almost immediately. Such an expansion and reversion would mean a sudden demand on mill capacity that would cause a false impression and a temporary condition of activity that would be likely to have a more unfortunate effect than to continue along present lines with a gradual growth in size of orders. Everybody will be pleased, of course, to see any improvement in condi- there are many indications that such a condition of tions that will warrant larger indivilual orders and affairs will develop before many months.

AUSTRALIAN TRADE AGREEMENT.

Some light is beginning to shine through the cloud that has hung over our trade relations with Australia. There is beginning to be a sign of hope that some arrangement may be made whereby the interchange of products in both directions will be facilitated. Our trade commissioners in various countries are constantly pointing out not only the market for Canadian goods in the countries where they represent Canada but also endeavor to point out the products of such countries which could be exchanged for Canada's exports. The principal difficulty that arises is that the industry interested in exporting goods is not as a rule interested at the same time in importing materials from the countries to which their own product is sent, so that there is no direct interchange of benefits from tariff concessions. About the only exceptions are in our relations with Great Britain and the United States, and even in these cases there are not many industries which can support reciprocal trade movement to any great extent. Take our own industry for example. We purchase china clay, felts, wires, chemicals, dye stuffs and machinery, rags and waste paper from Great Britain, we also purchase these materials and the additional items of coal, sulphur and rosin from the United States. In many of these cases there is a tendency for Canadian manufacturers to supply the home market and Canadian concerns should support these efforts just as they hope to have the Canadian market prefer their own products. Take for example the manufacture of paper machine felts or wires, or even the machines themselves and we find the Canadian product quite equal to the requirements of our mills. In some cases it is necessary for Canadian manufacturers of equipment or supplies to import their raw materials; in some cases there is the choice in source of supply between some part of the Empire and some other country.

There is a tendency on the part of the different members of the Empire to foster a more extensive trade under the flag. The principal factor or inducement to the purchase of goods produced in one part of the Empire by the purchaser in another is a lower price or a better quality. It is not always possible for the manufacturer to lower his cost; the only chance for business aboard then is a tariff arrangement.

There are some materials purchased by Australia which could be imported also from some other country and there are articles exported by Australia which are produced in several different countries. The product which most concerns us is paper but there are other Canadian products such as lumber that Australia could purchase elsewhere unless there is some inducement in the way of service or price which will make it advantageous to buy Canadian goods. Now Canada has a tariff on practically all classes of imports and Australia likewise has a tariff. Australia has seen fit to make certain concessions to British exporters whereby duty on their goods is less than the duty on the same class of good from other countries, including Canada. The export of paper is seriously hindered by reason of the non-inclusion of the Dominion in the preferential terms extended to another part of the Empire. It not only gives the British mills a very considerable advantage over the Canadian mills but because of the rate of exchange and low manufacturing cost in certain other European countries, Canada is placed at a district disadvantage with respect to such competition. To make no concession for such conditions in the markets to which we export our products, makes it difficult to maintain the high standard of living which is typical of English speaking countries and for the continuance of which it seems right that the different parts of the Empire should co-operate.

It is reasonable to expect that Australia should want a quid pro quo for any tariff concessions but the arrangement of details cannot be properly accomplished by any one group as it is necessary to survey the whole field of exports and imports in order to ascertain where the greatest benefit would come from such a reciprocal arrangement. It is exceedingly important that some arrangement be arrived at and the appointing of a commission such as was advocated by the Pulp and Paper Association and suggested to the Canadian Department of Trade and Commerce by the delegation this week, seems to be the most feasible manner of solving the problem. There should be no delay in deciding on the method of going about it as the longer action is postponed the more difficult it would be to arrive at a satisfactory arrangement. In connection with the activities of such a commission, it should be pointed out that considerable benefit should come to both the Dominion and the Commonwealth through the publicity that could properly be given to the deliberations of such a commission by which the Canadians and Australians would each come to know more of the other's country and by the mutual exchange products feel better acquainted and more inter-dependent than has been the case hitherto.

HELPING TO MAKE BUSINESS.

There is tendency on the part of the different mem- to be partial to any Canadian paper maker. The reason for mentioning a particular firm in this instance is because we feel that the step taken and the initiative shown is worth special attention and should be brought to the notice of the industry.

We refer to the portfolio of advertising plans for the printer which has just been distributed by the Howard Smith Paper Mills Ltd. This is a collection of plans by which the printer is helped to lay out a definite program of going after business and incidentally showing important ways of effectively using Canadian-made papers. There is no doubt that the printer comes very near being the keystone of a business revival and of business progress. The product of the printer, whether it be a newspaper, a magazine, a poster, a blotter or a pamphlet, is in probably a majority of sales, a connecting link between the producer and the consumer. Suggestions as to how this effective medium can be used with particular advantage is most appropriate at just this time.

It is not our intention to dwell at length on the several excellent plans suggested in the portfolio, but we do want to mention the prominence that is given to the use of blotting paper which has but just recently been put on the market as a Canadian product. The work of getting up this portfolio represents the finest type of printing and it is safe to say that if printers would use a similar high grade of attractive work in advertising their own business, they would not only have their shops full of work with a larger number of employees on the payroll, but through the service they would thus be selling and rendering to the general public, there would be a marked improvement in the amount of business passing with its inevitable reflection in improved conditions throughout our country. Besides showing several ways in using blotting as an advertising medium, there are suggestions for the use of bond papers in producing attractive selling letters, envelope stuffers and the like. There is also a plan for the use of booklets and also one for the development of the house organ and its function in the world of business. We not only congratulate the Howard Smith Paper Mills on the excellent character of this piece of work, but commend them for the initiative with which they have gone about this matter. Incidentally we should like to add that samples of Canadian paper specialties and examples of special efforts on the part of our Canadian mills, will be greatly appreciated by the Pulp and Paper Magazine.

Canada's Paper Trade With Australia

This week a deputation from the Canadian Pulp and Paper Association interviewed the Government at Ottawa on the question of the Australian and New Zealand tariffs on paper. The deputation consisted of Messrs. George M. McKee, president, C. Howard Smith, Howard Smith Paper Mills, Limited, Montreal; J. Rolland, Rolland Paper Company, Montreal; J. H. Thomas, J.R. Booth, Limited, Ottawa; John F. Taylor, E. B. Eddy Company, Ottawa; and Edward Beck, secretary and manager.

The Canadian Pulp and Paper Association is of opinion that the time is opportune for the negotiation of a preferential agreement. The association has suggested that a Government Commission, clothed with authority to negotiate concessions, subject to parliamentary ratification, should be sent from Canada to Australia for the purpose of dealing with the subject. The association is still of the opinion that such a Commission is desirable. Had such a Commissioner been sent to Australia during the early days of the present tariff law, an agreement might now have been an accomplished fact. As evidence to substantiate these views the fact is cited that the British Trade Commission to Australia was duly clothed with authority and that it is to the efforts and influence of that Commission, very largely, that the United Kingdom now owes the advantage it enjoys in the Australian market.

Australia Willing to Negotiate with Canada.

There is abundance of evidence to indicate that Australia is willing and even eager to negotiate with Canada at the present time. The Australian Premier, the Hon. W. M. Hughes, has formally notified our Government that the way is open. He is known to be sympathetic to Empire trade unity. Sir Joseph Cook, former Prime Minister and at present High Commissioner in London for Australia, on February 8th. of this year gave out a statement in London which was cabled to this country in which he says:—"The time is now ripe for a real effort to be made to adjust the fiscal differences between Canada and Australia. Canada sells to Australia nine times the value of the goods which Australia sells to Canada. Is it any wonder that the Australians' interest in reciprocity with the sister dominion is but lukewarm? It is clear that Canada buys largely from her big neighbor, the United States, and passes the Commonwealth by. The result of it all is that for customs purposes Australia treats Canada as a foreign nation. The time is now ripe for a real effort to be made to adjust these differences, for it cannot be doubted that mutual benefit would accrue. The blood bond, sentiment and self interest unite in demanding closer commercial ties among the community of nations which form the Empire and the breaking down of the rigid bulkheads, which now effectively 'water-tight' the dominions, and separate them into commercially competing and antagonistic trading communities."

The Honorable Massey Green, Minister of Trade and Commerce, in his speech in the Australian parliament dealing with the present tariff said that, "The Ministry propose to extend to Canada the British preference under the Tariff Bill. It is not proposed to extend reciprocity to any country other than a British Dominion in regard to paper, but the intermediate tariff could be extended to countries other than British Dominions".

The Honorable G. F. Pearce, Minister for Home and Territories of Australia and the Commonwealth's representative at the Washington Arms Conference, now in this country, declares that Australia is eager to extend its trade with this continent, and emphasizes the advantage that arises out of the fact that our shores are two weeks nearer to Australia than any port in the United Kingdom.

A statement printed in the British Lumberman for December 1921 as coming from Australian merchants visiting Vancouver says: "At the present time Australia buys more goods, more lumber, more Douglas fir even, from the United States than she does from Canada. There is no preferential tariff for Canadian goods, the opportunities to arrange for the establishment of this having been seriously neglected on both sides. There is instead a feeling in Australia that the Commonwealth could supply many of the needs that the Dominion now buys elsewhere. Australia as a consequence replies by neglecting Canadian for other markets."

There have been many similar expressions from representative Australians.

Effect of the Australian Tariff on Canadian Paper Exports.

Prior to the enactment of the present Australian tariff law Canadian paper and paper products suffered no disability in that market as compared with like commodities from other countries. The present law gives newsprint paper from the United Kingdom an advantage of £3 (normally $14.60) a ton over newsprint from Canada and elsewhere, and of 10 per cent. ad valorem on other classes of paper.

Figures reported by the Canadian Trade Commissioner at Melbourne show that for the three five-year periods ending respectively, on June 30, 1910, 1915, 1920, the value of newsprint imported into Australia amounted to the following:

	Value.
Five years ending June 30, 1910	£2,909,107
Five years ending June 30, 1915, ...	3,974,581
Five years ending June 30, 1920	7,100,318
Year ending June 30, 1921	3,460,750

The proportion of these imports derived respectively from Great Britain, Canada, the United States and Scandinavia are given as follows:

	Five Years Ending June 30					
Imports from	1910		1915		1920	
	Value	%	Value	%	Value	%
Great Britain	£1,035,742	36	£1,531,811	39	£1,042,597	15
Canada	648,808	22	643,821	16	1,946,983	27
United States	676,492	23	697,286	18	1,786,056	25
Scandinavia	252,558	9	854,794	22	2,152,210	30

The corresponding figures for the year ending June 30, 1921, are:

Great Britain	£ 695,890	20
Canada	977,698	28
United States	265,716	8
Scandianvia	1,337,106	39

Canada's exports of newsprint to Australia rose, in a gradually ascending scale, from 12,007 tons, valued at $454,183 in Canada's fiscal year 1914 to 37,120 tons, valued at $4, 256, 850 in 1921, while the value of our exports of other grades of paper, such as wrapping, writing, etc., reached a total of $1,671,262 for the fiscal year ending March 31, 1921.

Since the adverse tariff came into effect Canadian exports of newsprint have steadily declined and do not now exceed 50 per cent in volume or 30 per cent. in value of those of 1921. The decline would undoubtedly have been even more marked but for the existence of unexpired contracts and for the willingness of some of the exporters to carry the burden of the excessive tariff on whatever business they could retain pending the outcome of efforts to have the disabilities now imposed upon them removed. Canadian exports of other grades of paper to Australia have suffered a corresponding diminution. Unless the inequality of the preference tariff is removed it is feared that it will result ultimately in the virtual exclusion of Canadian paper of all kinds from the Australian market.

The decline in Canadian exports, it is to be noted, is coincident with a market growth in the Australian demand for paper as shown by the following statement of imports into Australia for the fiscal years 1919-1920 and 1920-1921:

	1919-20	1920-21	Increase
Cardboard, etc.	£ 157,436	389,265	231,289
Printing	1,422,463	3,876,848	2,453,885
Wrapping	299,102	688,007	388,905
Writing & Typing ..	435,497	995,109	559,612
Other	535,699	1,126,800	591,101

On the other hand, as might be expected, British papermakers make no effort to conceal the benefits they are deriving from the efforts of the preference accorded their products in the new tariff.

Arguments in Favor of Reciprocity.

The Canadian Government have their own line of steamers which are trading to Australian ports. They are fitted with refrigerating plants in order to carry Australian products to Canada on the return voyage. Obviously, these steamers look for regular paper shipments to assist in the interchange of trade between the two countries. Freight rates by Government steamers are on a par in both countries.

Australia is willing to buy from Canada but believes Canada should in turn be willing to buy from Australia. In the opinion of many who have studied the subject there is opportunity for trading in both directions without doing violence to the interests of either country.

Officers of the C. P. & P. A.

The following is a complete list of the officers and committees of the Canadian Pulp and Paper Association for 1922.

Officers.

President: George M. McKee, Donnacona Paper Co., Ltd., Donnacona, Que.

Vice-President: H. F. E. Kent, Kinleith Paper Mills, Ltd., Toronto, Ont.

Secretary and Manager: Edward Beck, 701 Drummond Bldg., Montreal.

EXECUTIVE COUNCIL.

This consists of the above officers and the following: P. B. Wilson, ex-president, Spanish River Pulp and Paper Mills, Ltd., Sault Ste. Marie, Ont.; George Chahoon, Jr., Chairman Newsprint Section, Laurentide Co., Limited, Grand Mere, Que.; F. J. Campbell, Chairman, Wrapping Paper Section, Canada Paper Co., Ltd., Windsor Mills, Que.; T. J. Stevenson, Chairman Sulphite Pulp Section, The Riordon Sales Corporation, Montreal; C. R. Whitehead, Chairman Kraft Pulp Section, Wayagamack Pulp and Paper Co., Ltd., Three Rivers, Que.; Frank W. Clarke, Chairman Mechanical Pulp Section, Gulf Pulp and Paper Co., Ltd., Quebec; Jean Rolland, Chairman, Book and Writing Section, Rolland Paper Co., Limited, St. Jerome, Que.; D. F. Robertson, Chairman, Board Section, Canadian Paperboard Company, Ltd., Montreal; George Carruthers, Chairman Tissue Paper Section, Interlake Tissue Mills, Limited, Toronto, Ont.; George Pauline, Chairman Coated Paper Section, Ritchie and Ramsay, Ltd., Toronto, Ont.; O. F. Bryant, Chairman Technical Section, Laurentide Company, Limited, Grand Mere, Que.; R. P. Kernan, Chairman, Woodlands Section, Donnacona Paper Co., Ltd., Donnacona, Que.

TECHNICAL SECTION.

O. F. Bryant, Chairman, Laurentide Company, Ltd., Grand Mere, Que.; R. W. Hovey, Vice-Chairman, Abitibi Power and Paper Company, Ltd., Iroquois, Falls, Ont. Councillors:—Maurice Neilson, Belgian Industrial Co., Ltd., Shawinigan Falls, Que.; C. N. Gain, Don Valley Paper Company, Toronto, Ont.; George Carruthers, Interlake Tissue Mills, Ltd., Toronto, Ont.

WOODLANDS SECTION.

R. P. Kernan, Chairman, Donnacona Paper Company, Ltd., Donnacona, Que.; B. F. Avery, Vice-Chairman, Spanish River Pulp and Paper Mills, Ltd., Sault Ste. Marie, Ont. Councillors:—S. L. DeCarteret, Brown Corporation, Quebec, Que.; T. F. Kenny, Jas. Maclaren Company, Buckingham, Que.; Ellwood Wilson, Laurentide Co., Ltd., Grand Mere, Que.

COMMITTEE ON TECHNICAL RESEARCH INSTITUTE.

Col. C. H. L. Jones, Chairman, Spanish River Pulp and Paper Mills, Ltd., Sault Ste. Marie, Ont.; J. M. McCarthy, Price Bros and Company, Ltd., Quebec, Que.; F. A. Sabbaton, Laurentide Company, Ltd., Grand Mere, Que.; R. W. Hovey, Abitibi Power and Paper Co., Ltd., Iroquois Falls, Ont.; Dr. John S. Bates, Bathurst Company, Ltd., Bathurst, N. B.; John Stadler, Belgian Industrial Company, Ltd., Shawinigan Falls, Que.

COMMITTEE ON VOCATIONAL EDUCATIONAL TEXT-BOOKS.

George Carruthers, Chairman, Interlake Tissue Mills, Ltd., Toronto; R. W. Hovey, Abitibi Power and Paper Company, Ltd., Iroquois Falls, Ont.; J. O. Mason, Laurentide Company, Ltd., Grand Mere, Que.; J. N. Stephenson, Pulp and Paper Magazine, Gardenvale, Que.; W. A. Anderson, Kinleith Paper Mills, Ltd., St. Catherines, Ont.; W. G. Mitchell, Price Bros and Co., Ltd., Kenogami, Que.; W. B. Campbell, Provincial Paper Mills, Ltd., Georgetown, Ont.; O. F. Bryant, Laurentide Company, Ltd., Grand Mere, Que.; T. Linsey Crossley, 208 King St. W. Toronto, Ont.

COMMITTEE ON EDUCATION BY CORRESPONDENCE.

T. Linsey Crossley, Chairman 208 King St. West, Toronto, Ont.; George Carruthers, Interlake Tissue Mills, Ltd., Toronto, Ont.; A. P. Costigane, Ontario Pulp and Paper Makers' Safety Association, Toronto, Ont.; C. N. Gain, Don Valley Paper Company, Toronto, Ont.; J. N. Stephenson, Pulp and Paper Magazine, Gardenvale, Que.; D. Daverin, Provincial Paper Mills; Ltd., Thorold, Ont.

The Shevlin-Clarke Company has set down an appeal against the decision of Mr. Justice Logie in that the trial judge erred, it is alleged, in admitting certain evidence tendered by the Attorney-General and in excluding other evidence tendered by the Company. Another objection is that Justice Logie erred in directing the Company to pay the costs of that branch of the case in which the Attorney-General alleged, but failed to prove, fraud.

Justice Logie had previously entered judgment against the company for $169,991.29 with respect to berths 45 and 49 of Quentico Forest Reserve and increased the stumpage of pine to $17.60 as fair value.

Pumps and their Characteristics

By E. F. DOTY.

(Continued from last issue.)

CHAPTER VII.

Centrifugal Pumps, Part 2.

As indicated by Part 1, the principle of operation of centrifugal pumps is peculiar to itself. In the first place we should explain that these pumps are not self priming; that is, they will not lift water under suction conditions until they are primed, or in other words, filled with water.

The reason for this is that there is a free waterway through the entire pump so that at no period in a revolution is the suction opening closed off from the discharge opening and therefore positive displacement of the air in an empty pump cannot take place, the air in the pump is simply churned around in the impeller and through the clearance spaces.

It is therefore necessary to prime or fill a centrifugal pump before it can be operated and this may be accomplished in a number of ways:

First: By placing the pump below the level of the liquid to be lifted, either by submerging the pump in it or by setting the pump in a pit or depression so that the liquid will flow into the pump and fill it.

Second: By locating the pump at the side of a tank which holds the supply of liquid to be pumped and having the level in the tank higher than the top of the pump before starting it up.

This is the method usually employed in papermill practice.

Third: By placing a foot valve at the lower end of the suction pipe and filling the pump and suction pipe with water from any available supply before starting the pump.

Fourth: By means of an ejector connected to the high point of the pump casing and siphoning the air out of the pump and suction pipe producing sufficient vacuum to allow the atmospheric pressure to raise the water level within the pump to a sufficient height to fill it.

Steam, compressed air, or a water supply under pressure may be used for operating the ejector.

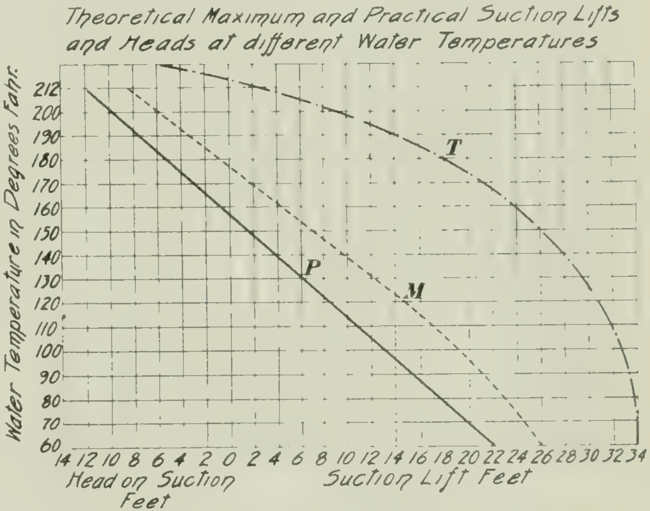
Fifth: By means of an air pump connected to the high point of the pump casing and displacing the air in the pump casing and suction pipe, the operation having the same effect in priming the pump as the fourth method.

It will be understood that a centrifugal pump when properly connected will raise water as high by suction as any other type of pump and usually they may be depended upon to operate with suction lifts somewhat higher than pumps having suction valves for the reason that in the centrifugal pump the flow through the suction pipe when once started is continuous and not intermittent or periodic with opening and closing of the pump valves: also a small part of the atmospheric pressure used in raising the water up to the pump must be expended in opening the valves and in the centrifugal pump this amount of atmospheric pressure may be added to the actual suction lift.

However it is not advisable to arrange pumping installations with extreme suction lifts because slight leaks in suction pipes and stuffing boxes are always liable to occur and suction troubles are often hard to overcome in any type of pump.

In considering the possible and practicable suction lift there are two important natural conditions to consider:

First: The temperature of the liquid to be pumped. At low temperatures water does not vaporize and consequently higher suction lifts may be handled but at temperatures where vaporization takes place suction lifts must be materially reduced and where sufficient vapor tension or expansion of vapor occurs to occupy space or volume in the pump; or in other words, where the pump does not fill solidly with water, there must be sufficient head or positive pressure on the suction of the pump to overcome the vapor tension or expansion of vapor in the pump shell; that is, enough positive head must be available to compress the vapor and prevent such expansion.


Theoretical Maximum and Practical Suction Lifts and Heads at different Water Temperatures

Suction Lift or Head is the vertical distance from the water supply to the Discharge Valve Deck, plus Friction in pipe in case of Suction Lift, and minus Friction in case of Head on Suction.

P = Practical Suction Lift.

M = Maximum Suction Lift under very favorable condition.

T = Theoretical Suction Lift.

All referred to 30" Barometer (Sea Level)

Fig. 28

Fig. 28 shows clearly the theoretical, maximum, and practical suction lift and required head on suction when handling water at different temperatures at sea level or as referred to a barometer registering 30" of mercury.

This diagram may be used in connection with any type of pump whether centrifugal or displacement.

It may be explained here as applying also to every type of pump that the practical suction lift will decrease at altitudes above sea level, (30" barometer) at the rate of 1.25 feet for each 1000 feet of elevation above sea level at which the pump may be located.

The theory of centrifugal pumps is based on the well known law of falling bodies in which the velocity of a body falling through the atmosphere into space increases in proportion to the square of the distance through which it falls.

The application of this theory to the centrifugal pump is in connection with the relation of the speed or velocity of the impeller at its outer diameter to the head which it will develop, or in other words, the head which an impeller of a given diameter will pump against at a given speed in R. P. M.

This may be clearly illustrated by an example:

A pump which operates at a speed of 1000 R. P. M. against a head of 25' will, if the speed is doubled so that it operates at 2000 R. P. M. work against a head of 100'. It will therefore be seen that the velocity at which the impeller revolves must be in proportion to the square root of the head.

This condition of operation will be found to be practically constant and reliable with impellers of normal design, but in actual operation the conditions will vary slightly due to the "characteristic" or shape of the vanes and the variation due to differences in loss of head when operating at different heads or pressures.

For instance, an impeller which is designed with a so-called "low speed characteristic", and rather steep outlet vane angle would, if operated at high speed, develop somewhat greater head than an impeller designed with a "high speed characteristic", but of the same diameter, though the later would operate at higher efficiency.

The other conditions which would have a tendency to vary the head from the theoretical are the differences in slip at the running clearances which will increase in proportion to the increase in head pumped against and will therefore affect the actual heads which a given impeller will develop at different speeds.

While the head is increasing as the square of the speed the capacity is also increasing theoretically in direct proportion to the increased speed, therefore, by referring again to the same pump we find that with an increase in speed of form 1000 to 2000 R.P.M., we not only get an increase in head from 25 to 100 feet but we also get an increase in capacity in direct proportion to the increase in speed, (or twice the original capacity).

For instance if the pump delivered 400 G. P. M. at 25' head and 1000 R.P.M. it will theoretically deliver 800 G.P.M. at 100 feet head and 2000 R.P.M.

It will therefore be seen that if the efficiency of a pump remained constant and theoretical conditions were obtained exactly in operation, that the power required to operate a pump would vary as the cube of the speed.

If we assume an efficiency of 50 p.c. for each of the above conditions it will be found that the power required for each one will be as follows:—

$$\frac{400 \text{ G. P. M. x } 25' \text{ head}}{3900 \text{ x } 50\% \text{ Eff'y}} = 5.06 \text{ HP}$$

and

$$\frac{800 \text{ G.P.M. x } 100' \text{ head}}{3900 \text{ x } 50\% \text{ Eff'y}} = 40.48 \text{ HP}$$

The latter conditions requiring 8 times as much power as the first set of conditions.

As in the case of the head variations there are also conditions which enter into the capacity variations at different speeds which will prevent the actual capacities pumped from being exactly the theoretical.

These conditions which cause the variation from the theoretical capacities consist of difference in friction losses due to handling water at different velocities through the casing and impeller; these losses work in conjunction with the differences in loss of head due to friction.

Other conditions which vary the capacities are due to the design of the impeller and casing and especially so in the case of the so-called "non-overloading" impellers which are designed with restricted inlet areas so that at acertain speed they will not deliver more than a certain predetermined quantity of water no matter how much decreased in the head. This characteristic will be explained and illustrated later.

The usual formula for impeller velocity necessary to develop a certain total head in head is represented by:

H x 8 x 60 = Impeller velocity in feet per minute.

H = Total head in feet including suction, friction and velocity head.

8 = Constant for normal impellers with vanes curved backward.

60 = Seconds per minute.

This formula does not provide for the additional impeller velocity which is necessary to produce the flow equal to the pumping capacity required and as the lineal rate of flow through the discharge of the pump is approximately equal to the velocity added for flow the formula becomes:—

H x 8 x 60 + LV = Impeller velocity in feet per minute necessary to develop the head and required discharge velocity or capacity.

LV = Lineal discharge velocity in feet per minute.

For example:

We have a pump whose discharge opening is 4" diameter and normally proportioned throughout from which we require a capacity of 400 G.P.M. against a total head of 25'. We have the following:

$$\frac{400}{12.5 \text{ x } 3.12} = 10.25'$$

per second velocity when pumping 400 G.P.M. through 4" diameter discharge opening.

12.5 = Area of 4" diameter opening in square inches.

3.12 = Constant developed for calculating velocity through known area.

Therefore: 10.25 x 60 = 616 feet per minute should be added to produce a flow of 400 G.P.M.

Then we have 5 x 8 x 60 + 616 = 3016 feet per minute impeller velocity to produce the above conditions.

5 = square root of 25 feet total head.

If it is necessary to know the necessary R. P. M. at which such a pump should operate and it is known that the pump impeller is 11-½" in diameter then we divide the impeller velocity by the circumference in feet the result being the R.P.M. viz:—

$$\frac{3016 \text{ x } 12}{11\frac{1}{2} \text{ x } 3.1416} = 1000 \text{ R.P.M.}$$

If, however, we wish to produce the above conditions with a 4" pump and the speed in R. P. M. at which we can operate the pump has been fixed, we must determine the proper diameter of impeller in selecting a pump to meet our conditions, therefore we have, say, to run the pump at a speed of 1000 R. P. M. and the impeller diameter is found as follows:—

$$\frac{3016 \text{ x } 12}{1000 \text{ x } 3.1416} = 11\text{-}\tfrac{1}{2}'' \text{ diameter of impeller.}$$

We will now consider the velocity or rate of discharge in centrifugal pumps which will cover the usual range of economical operation.

In general it may be said that for pumping water and fluids of which water forms the greater part or which do not produce excessive loss of head in the pump due to friction, that the range of velocities for best results will come within the following.

Velocities at suction inlet 6 to 12 feet per second.

Velocities at discharge outlet 8 to 14 feet per second.

These velocities may be classified to cover pumps of different standard sizes and various pumping conditions as follows:

For small pumps, up to 4’’ discharge, and for heads up to 20’. Inlet velocity 6’ per second, outlet velocity 8’ per second.

For same size pumps and for heads between 20 and 40’: Inlet velocity 8’ per second, outlet velocity 10’ per second.

For same size pumps and for heads above 40’: inlet velocity 10’ per second, outlet velocity 12’ per second.

For medium size pumps from 5’’ to 15’’ discharge and for heads up to 20’: inlet velocity 7’ per second, outlet velocity 9’ per second.

For same size pumps and for heads between 20 and 40’: inlet velocity 8’ per second, outlet velocity 10’ per second.

For same size pumps and for heads between 40 and 60’: inlet velocity 9’ per second, outlet velocity 11’ per second.

For same size pumps and for heads 60’ and upwards: inlet velocity 10’ per second, outlet velocity 12’ per second.

For large size pumps 18’’ discharge and upwards, for heads up to 20’: inlet velocity 8’ per second, outlet velocity 10’ per second.

For same size pumps and for heads between 20 and 40’: inlet velocity 9’ per second, outlet velocity 11’ per second.

For same size pump and for heads between 40 and 60’: inlet velocity 10’ per second, outlet velocity 12’ per second.

For same size pumps and for heads between 60 and 80’: inlet velocity 11’ per second, outlet velocity 13’ per second.

For same size pumps and for heads upwards of 80’: inlet velocity 12’ per second, outlet velocity 14’ per second.

From the above somewhat arbitrary tabulation it will be noted that the lineal velocities at the suction and discharge passages through the pump casing should be arranged, if good efficiency is to be obtained, with a view to preventing excessive losses due to friction of the water passing over the interior walls or surfaces of the pump casing as well as the friction due to the particles of water rubbing together.

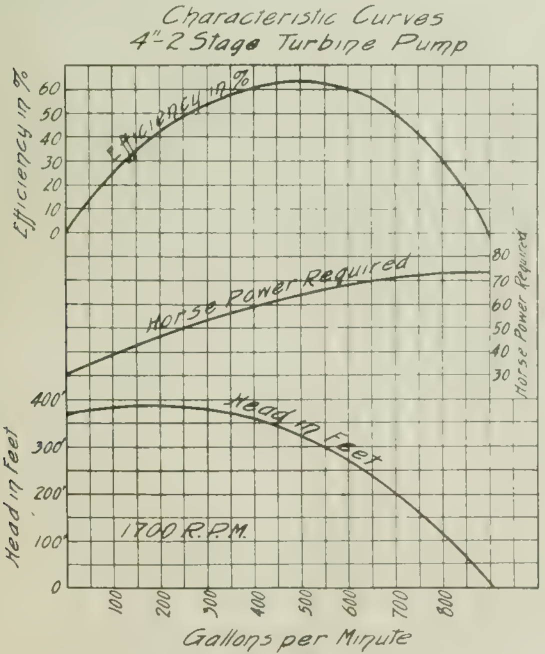


Fig. 29

These friction losses are in definite proportion between the area of the wetted surfaces of the metal over which the water passes and the area of cross section which the metal surfaces enclose, and as these friction losses are also proportionate to the square of the velocity at which the water is moving through the cross sectional area, irrespective of the pressure on the water within the pump casing, it will be evident that the smaller pumps will have greater friction losses than larger ones when handling water at the same velocity and likewise that as the friction loss for a given velocity remains constant over any variation of head or pressure; that with increasing head higher velocities may be handled without increasing the friction losses proportionate to the increase of head.

Characteristic Curves.

A short while back we spoke of centrifugal pump characteristics: these are usually developed as showing graphically the performance of a centrifugal pump at a constant speed over the entire range of conditions at which it is possible to operate at the given speed.

This range will be from 0 capacity at maximum or shut-off head to maximum capacity and zero head.

In Fig. 29 a set of characteristic curves are shown which illustrate very clearly the complete operation of the pump under all conditions of head within its scope at the speed for which these curves were developed.

The head quantity curve shown in this figure is a conventional one in which the quantity increases gradually as the head decreases to the point of 0 head and maximum discharge.

In Fig. 30, is shown another set of characteristic curves which are made from tests of a pump having a “non-overloading” type of impeller.

With this type of impeller the maximum capacity point is controlled through the proportion and shape of the inlet so that when this capacity is reached the capacity does not increase any further when the head is reduced, but the head quantity curve drops vertically as shown.

The object of these “non-overloading” type impellers is to prevent overloading motors under varying

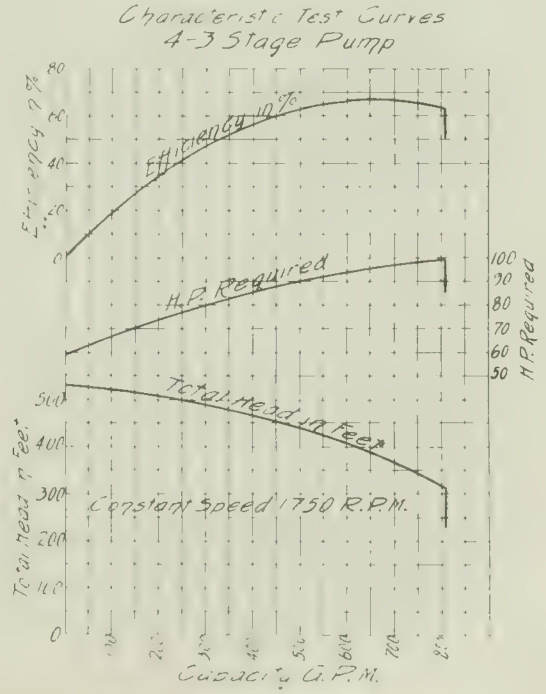


Fig. 30

conditions as it will be noted that the power curve rises gradually up to the point where maximum capacity is reached and then drops off with the head quantity curve. With these impellers the maximum power requirement can be provided for which will care for any possible condition met with and without having to provide motors of extra large capacity to take care of possible overloading.

The characteristic curves of a centrifugal pump contain very useful information for an operating engineer as he can determime from such test curves just what the pump should be doing without making a complete test. Assuming that the pump is operating at the speed for which the characteristic curve was made he can by putting gauges at the suction and discharge of the pump so as to check the pumping head, determine from the curve how much capacity is being pumped and how much power is being consumed. Likewise if the operator cannot conveniently check the head with gauges or otherwise, but he is able to check the quantity pumped by means of tanks or weirs, etc., he can check this capacity test against the curve and ascertain the head and power reading.

Operating troubles may also be determined by a check test against the curve, such as excess slippage due to internal wear, which will show up by reduced head and capacity combined, while operating at normal speed.

The characteristic curves will also be found most useful in cases where it is desired to change the location of a pump and to operate it under different conditions and perhaps for different conditions than those for which it was originally installed. If the speed is to remain constant the curves will indicate the capacity which may be expected and the power which will be required for operating under head to be met with under the new conditions, or if the speed is to be changed, the curve may be used in connection with the data already given in this chapter to determine a few new points, using the original head quantity curve as a basis, and with at least three new points located, and not located too closely together, a new head quantity curve may be drawn, for the new speed at which the pump is to operate; this new head quantity curve will be approximately parallel with the original curve.

We will take an example of this as follows:—

Our original 4'' pump when operated at 1000 R.P.M. shows a head quantity curve with points thus:

Head in Feet	G.P.M.
39	0
31½	200
25	400
19	600

If this pump should be operated at 1200 R.P.M. it should show the following points in the new curve:

Head in Feet	G.P.M.
56.2	0
54.5	240
36.2	480
27.4	720

These points are interpolated from the points given above for operation at 1000 R.P.M. The efficiency curve usually remains nearly constant with the capacity within ordinary changes of head, and for such a change as we have recited above the same efficiencies as were shown on the original curve may be applied for the same capacities on the new head curve.

(To be continued.)

FROM THE NATIONAL FORESTRY PROGRAM COMMITTEE

"Forest fires must be prevented and cut over lands reforested," said R. S. Kellogg, Chairman of the National Forestry Program Committee. "We know today that if fires are prevented, many extensive areas will naturally reproduce the forest growth, but there are 81,000,000 acres of cut over land which need reforestation.

"We can with some degree of confidence make the following general assumptions for pulp wood forest growing, for instance over large areas:

"1. A cost of $15 per acre for land and the restocking of it with young trees.

"2. An annual protection charge of 5 cents per acre.

"3. Six per cent compound interest on the investment. .

"4. We are justified in assuming that in the near future we are likely to have a cutting tax, instead of an annual tax upon private forest land, and we are fixing this high enough when we make it 16 2-3 per cent upon the final yield, which is equivalent to an annual tax of 1 per cent. upon actual value with a 6 per cent interest rate.

"5. We are also justified in assuming, under good conditions, a yield of 20 cords per acre at the end of forty years.

"Applying the usual formulas of forest finance, we get $10 per cord as the cost of growing this pulpwood stumpage, and we need have no hesitancy in saying that pulpwood stumpage will be worth more than $10 per cord long before it can be grown.

"The foresters can now demonstrate to hard-headed business men that in forestry and not in destructive logging lies the future of the great industry of paper making, and the paper industry already has many large companies which are practicing forestry. The same conditions in a broad way apply to the lumber industry as well."

EXPORTS OF WOOD AND PULP TO U. S.

Mr. G. C. Woodward. American Consul at Campbellton, N.B., reports the following invoiced exports of wood and products to the United States from the Campbellton Consular District during the calendar years 1920 and 1921.

Campbellton Consular District includes the Agencies at Gaspe, Quebec and Bathurst, N.B., and covers the counties of Restigouche and Gloucester, New Brunswick and Gaspe, Matane and Bonaventure, Quebec.

Articles	Unit Qty.	Quantity 1920	Value 1920	Quantity 1921	Value 1921
Wood & Products:					
Lath	M	36.137	$ 520.425	96.205	$ 530,871
Lumber:					
Miscellaneous[1]	M	175	8,990	37	1,579
Pine	M	1.924	78.684	1.790	64.110
Spruce ..	M	46.235	1.853.052	44.599	1,331,054
Miscellaneous[2]		......	......	......	723
Poles	pc	......	......	13.711	62.967
Pulpwood	cd	39.972	777.831	14,223	224,813
Shingles ..	M	49.572	314.647	65.325	293.723
Ties	pc	141.183	137.655	35.903	36.140
Trees fir	bdl	......	......	5.695	1.655
Woodpulp	lb	71.778.000	4.270.537	22.327.616	682.612
Total			$7.761,821		$3,230,247

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[1] Includes Cedar, hardwood, poplar, etc.

[2] Includes Ship's knees, spars, logs, posts, etc.

Annual Meeting Of The C. P. & P. A.

REPORTS OF SECTIONS OF C. P. & P. A.

(Continued from last issue.)

Board Section.

Mr. President and Gentlemen:

In conformity with the usual practice, I beg to submit the following report for the Board Section covering the year just past.

The Board branch of the paper industry, in common with others, has fared somewhat badly throughout the year. Production which had reached its highest point in May, 1920 and had consistently slumped through the remainder of that year, continued its descent in January, 1921. There was a slight improvement during February and March, but the succeeding months witnessed a recurrence of the slump, the low point being reached in May. From then on the tendency was upward, but production throughout the year ranged below that of any year since 1917, and finished the year at a point lower than was touched during either 1919 or 1920. Market prices, naturally, followed the trend of lessened demand and on the whole the year may be regarded as a lean one for this branch of the industry.

Production figures for boards of all descriptions during the last four years compare as follows:

Year	Tons	Value
1917	54,080	$3,543,168
1918	87,749	5,551,409
1919	137,678	8,892,046
1920	158,041	12,904,662
1921	63,407	

The conditions herein described may be said to be due entirely to general trade conditions, to which the board industry is particularly susceptible. As to the future, it can only be said that that also depends upon what is in store for business in general. Should there be a universal revival in trade next year, as some predict and all hope for, the board industry of Canada naturally will participate in it.

Our section has held together very well considering the trying period; the members have, as a general thing, co-operated so far as possible for the general good. There have been the usual number of meetings. Our relations with the Box Manufacturers, our principal consumers, have continued on an harmonious basis.

One of the important things carried out during the year was a complete survey of the paper container market of Canada, undertaken jointly with the Canadian Box Manufacturers' Association, the object being to devise ways and means for promoting the greater use of paper boxes and consequently of boards. A great deal of effort and energy was expended in this direction by our late secretary, Mr. A. L. Dawe, to whom much credit is due. The result has been to educate both our own members and those of the Box Manufacturers' Association as to the possibilities of increasing the use of both boards and boxes in a way that is bound to bear fruit in the future.

All of which is respectfully submitted,

J. F. TAYLOR,
Chairman.

Wrapping Paper Section.

Mr. President and Gentlemen:

The trend of the wrapping paper market during 1921 was exactly the reverse of the previous year, when for the first six months prices kept advancing.

During the first six months of 1921 prices were reduced slowly but steadily until, in July, they had reached a point almost 50 p.c. below those of 1920.

Having reached this point the market steadied and during the fall, in fact right till the end of the year, although prices remained low, the demand for all grades of wrappings was remarkably steady and of fairly good volume.

During the year frequent meetings of the wrapping manufacturers were held and, thanks to conservative action and reasonable restraint by all concerned, the difficulties of a very trying year have been dealt with as well as could be expected.

Signs of some relief in freight rates are encouraging, as freight is a heavy item in the cost of wrapping papers, and it is more and more apparent that a substantial reduction of freight rates will do much to reduce the cost of living and facilitate an increased interchange of commodities.

During the coming year manufacturers will have to devote their attention to getting down both cost of manufacturing and selling. Too wide a spread to the jobbers means increased cost to the consumers and decreased consumption of paper.

By giving due attention to this and similar points it would appear as though the wrapping manufacturers could look for a reasonable return during the year 1922.

The mills reporting to this Association produced during the year 16,172 tons of wrappings, made up as follows: Kraft, 4,103 tons; Mill Wrappers, 5,027 tons; various grades, 7,042 tons. In 1920 the same mills reported 18,603 tons of wrappings, made up of 4,654 tons of kraft; 4,778 tons of mill wrappers and 9,171 tons of various grades.

All of which is respectfully submitted.

F. J. CAMBELL,
Chairman.

Felt Section.

Mr. President and Gentlemen:

The year 1921 proved one of extreme difficulty for the felt manufacturers owing to the readjustment of prices and lack of demand. I feel, however, that the assistance we obtained through the Association and the faithfulness of our members in attending meetings, of which twelve were held during the year, helped us in tiding over a troublous period and rendered our difficulties less onerous than those experienced by felt mills in other countries.

The retarding of building construction, particularly of dwelling houses, owing to the uncertainty as to values, naturally affected our business adversely, but the indications are that building costs have now reached bottom and that a revival of construction activities will soon be in order. We, therefore, look forward to the coming year with considerable confidence and believe it will bring in a steady volume of business without undue fluctuation in price.

We desire to record our sincere regret at the resignation of our late secretary, Mr. A. L. Dawe, and our appreciation of his valuable services, as well as our wish for his complete success in his new venture.

All of which is respectfully submitted.

W. E. WALKER,
Chairman.

Coated Paper Section.

Mr. President and Gentlemen:

The Coated Paper Mills like most other branches of the industry have felt the result of the general depression in trade and consequently have not been able to operate to full capacity.

Reductions in prices have been made, consistent with the cost of raw materials, but these are still high, and to some extent have had an adverse effect on the demand for Coated Paper.

The outlook is very uncertain but we hope the Spring will see a return to more normal conditions.

GEORGE W. PAULINE,
Chairman.

Report of Traffic Department.

Mr. President and Gentlemen:

Since our last annual report, transportation conditions in this country have changed completely and the trend of freight rates is now downward instead of upward.

In August last, realizing the necessity of lower freight rates for our raw materials, we made strong representations to the Board of Railway Commissioners asking that rates on pulpwood, woodpulp, coal, lime, rags and sulphur to be reduced to the basis in effect prior to September 13th, 1920. At that time the Board was in conference with the railways looking to a slight general reduction on all classes and commodities, but nothing was done owing to the uncertainty as to what would happen in connection with railway wages. This question was finally settled, and effective December 1st, on order of the Board of Railway Commissioners, rates in Eastern Canada were reduced to the basis of 25 p.c. higher than those in effect prior to September 13th, 1920, instead of 35 p.c., or in other words, effective December 1st, 1921, the then existing rates were reduced 7.4 p.c. This reduction applied only in Canada and did not affect rates on coal.

Rates on pulpwood between Canadian points were reduced in August last, but we have advised the railways that the reduction is not enough to permit of free movement.

On representations of this Department rates were published effective November 28th, to principal points in the Maritime Provinces, representing a reduction of 25 p.c. in carload rates on newsprint, wrapping, boards, as well as plain building and roofing felt, and a reduction of 15 p.c. on the higher grades of paper. This also carried with it a reduction of approximately 20 p.c. on less than carload shipments of newsprint and wrapping.

In several other cases reductions were secured for individual mills, where rates seemed to be on an unfair basis.

So far as rates to United States points is concerned, it is not likely that any general reduction will be made until the question of rates within the U. S. is settled. Hearings are being held before the I.C.C., commencing January 11th, with a view to determining what general basis shall apply after March 1st. Your traffic department is watching the matter carefully and will take any steps necessary with the view of effecting reductions on paper and woodpulp to United States points simultaneously with the publication of rates within the U.S.

Expense bills are still being checked for a number of our members and several good sized amounts have been recovered.

Now that the Department has been moved to Montreal we will be enabled to keep in closer touch with the head offices of the railways and it is suggested that members should take full advantage of the services offered.

G. P. RUICKBIE,
Manager.

Woodlands Section.

Mr. President and Gentlemen:

In previous years the Woodlands Section has usually held meetings in the summer or fall, but as 1921 advanced conditions in the industry were such that it seemed inopportune to arrange for any meetings of the Section other than the Annual Meeting.

However, the Committees appointed at the Fourth Annual Meeting have carried on their work as planned while the members of the section have accumulated and exchanged information of mutual benefit.

The Committee formed to consider the establishment of a School for Forest Rangers for the Province of Quebec met early in the year and has made a report on its findings which will be submitted to the Annual Meeting of the Section for further consideration before a report is made on the subject to the Executive Council of the Association.

In the month of May the Committee on Investigation and Research sent out a questionnaire relative to Improved Logging Equipment, to which replies were received from 60 p.c. of the companies represented in the Section. A detailed report has been compiled from the data received which will also be studied by the Annual Meeting.

The fire season of 1921 was one of the most serious experienced in many years. The number of fires, the area of young growth destroyed, the amount of merchantable timber damaged, and the expenditures for fire fighting were far above normal.

Despite the unfavorable season the various railway patrols showed a marked improvement over 1920. Both the Canadian National System and the privately-owned lines are to be commended on the results attained and for their hearty co-operation with the Protective Associations during 1921.

An innovation of particular interest to everyone directly or even remotely connected with forest protection is the development of a portable ranger's time-clock which will undoubtedly increase the efficiency of the average patrol many times over.

This adaptation of the watchman's clock is "foolproof" as well as "tamper-proof" and with a proper distribution of punching stations will give indisputable records of what patrols have been or are being performed and when, which information, as reported in the past, often could not be relied upon.

The development of this clock is due to the efforts of the Manager of the Laurentian Forest Protective Association in co-operation with one of the clock companies.

Disregarding the large supply of raw material on hand, the companies are salvaging as much fire- and insect-killed timber as possible this winter, which is practical conservation, and which activities are alleviating to some extent the state of unemployment which was so evident last fall in those communities which are the source of woods labor.

Progressive forestry legislation is receiving marked consideration at present. In the Province of Quebec additions and amendments to the existing laws will be brought up at the coming Session and the members of the Section will undoubtedly take an active part in forwarding the proposed improvements.

to express its appreciation of his help and interest on its behalf in the past, and also wishes him a full measure of success in his present undertaking.

S. L. de CARTERET,
Chairman.

To Mr. A. L. Dawe the Woodlands Section desires
Mr. President and Gentlemen:

Technical Section.

I am pleased to report that notwithstanding the difficulties which confronted the Pulp and Paper Industry throughout the year 1921, chiefly due to the adverse market conditions, the Technical Section has increased its membership, and through the hearty co-operation of its Officers and Members, has made good progress, and continues in its efforts towards increased usefulness to the Pulp and Paper Industry.

Two General Meetings have been held—the Annual Meeting, in Montreal, last January, and the Summer Meeting, which consisted of a visit to the Mills in the St. Maurice Valley. The success of the Summer Meeting was in a large measure due to the generosity of the Companies, who controlled these Mills.

We left Montreal via C. P. R. on the evening of June 14th, arriving on the following morning at Three Rivers, where we visited the International Paper Company's construction work. Here we saw much of interest, including a battery of oil-burning boilers. While in Three Rivers, we were delightfully entertained by the City Council. Their elaborate programme included a drive through and about the City, and also a luncheon and dinner at the historical Chateau de Blois.

We spent the following day in Grand Mere as the guests of the Laurentide Company, and were conducted through the Company's magnificent Hydro Electric Plant, and also their mammoth Paper Mills. While in the latter, we saw many things of interest, including, the two new electrically driven, high-speed News Machines, in successful operation. We spent a most enjoyable afternoon on the Company's golf links, and in the evening dined at the Laurentide Inn as guests of the Company. The operations of this Company presented a splendid example of what can be accomplished by modern industrial organization.

In the evening, we entrained for Shawinigan Falls, and on our arrival were welcomed by the Officers of the Belgian Industrial Co. We visited portions of their great plant the same evening. The following day, we were conducted through the entire plant, which was most interesting and instructive. As guests of the Company, we were driven to various points of interest around Shawinigan Falls, and we were further entertained at a luncheon at the Cascade Inn. The Members formed a most favorable impression of the manner in which this Company's operations are conducted. The General Manager, who is, as you know, Chairman of our Committee on Mechanical Standards, seemed to have practically everything under a recording meter, with the exception of the hospitality, which no meter could record. Our visit to Shawinigan Falls fittingly concluded our Summer Meeting. We returned to Montreal, with much to think about, and well satisfied with our trip.

Some very interesting and instructive discussions took place in connection with the Papers which were read at the January Meeting. These were as follows:—

"**Interlock Control of Paper Machine Drive,**" by T. W. Warburton, of the Harland Engineering Company, Montreal. This Paper was illustrated by lantern slides, and Mr. Warburton described the salient features of the Harland Electric Drive, and pointed out the reason why his Company regarded this form of Drive superior to Mechanical Drives.

"**Beating,**" by W. B. Campbell, of Process Engineers Ltd, of Montreal.

"**Testing Sulphite Pulp for Strength,**" by K. G. Wilen, Chief Chemist, of Wayagamack Paper Company.

"**Ventilation of Paper Mill Machine Rooms,**" by H. S. Taylor.

"**The Microscope and its Relation to the Pulp and Paper Mill,**" by J. L. Gartland.

"**The Insurance of Pulp Wood,**" was discussed on the basis of Mr. Hoxey's article on "The Protection of Log Piles by artificial Fogs." Mr. Hoxey referred to the particular points in his memo. of protection, and emphasized the point of "Protection" as the best Insurance.

"**Standing Committees:**"—"Educational Committee," "Mechanical Standards," "Moisture in Pulps," "Statistics," "Abstracts and Publications" reported satisfactory progress.

I would like to particularly call your attention to the work of the Educational Committee, including that of the Joint Committee on Text Books.

As you are aware, there are now two Volumes of the set complete. The third will be finished within a few weeks. The Text Book Committee have experienced considerable difficulty in getting complete manuscript from a number of the writers. It will be understood that many of these are extremely busy men, and I feel that we are deeply indebted to them for taking so much of their valuable time in the preparation of these manuscripts, in order that the Industry may have the benefit of the best information obtainable. In view of the great importance of this work, I have no doubt that the parent body will continue to give this Committee its best support in order that it may be completed within the least possible time.

"**Committee on Research**"—The Joint Committee on Research appointed by the Canadian Pulp and Paper Association and the Technical Section to investigate the possibilities re the establishment of a Department of Technical Research within the activities of the Canadian Pulp and Paper Association, was covered in a report by C. H. L. Jones, Chairman of the Committee. The Committee recommended, in brief, that the Association engage in the establishment and maintenance of a Department devoted to Technical Research on Pulp and Paper work, and that no attempt should be made to take over nor work through the Forest Products Laboratories, nor to attempt to build a Labratory of our own, until further developments have taken place, and that the Association should co-operate to the fullest extent with the Canadian Council of Industrial Research in furthering the project of the Canadian National Research Institute.

An interesting and instructive discussion followed, which resulted in a Resolution duly seconded that the Report of the Joint Committee be adopted, with the understanding that if the Parent Organization furished the financial and moral support, that they can be assured of the hearty co-operation of the Technical Section.

"**Membership**"—Our Membership, as we have already stated is steadily increasing, as shown by the following table:—

	Jan., 1921	Jan., 1922
Full Members	108	119
Associate Members	14	15
Junior Members	27	35
Student Members	17	16
	166	185

"Revision of Membership Qualifications"—With a view to insuring more harmonious co-operation between the Technical and the many able practical men within the Industry, who because of certain rules governing the membership were practically debarred from admission to this section,—it was resolved, duly seconded and carried that Article Eight of the Rules of Membership, should be altered so as to read as follows:

> "A member shall be twenty-eight years of age or over, and shall have a Technical Education, at least equivalent to Bachelor of Science Degree, or practical experience, that in the opinion of the Council shall entitle him to full membership."

Through this change, it will be seen that the Technical Section wishes to acknowledge our foremost practical men to be fully qualified and desirable candidates for full membership.

"Summer Students"—The plan which our Section adopted three years ago in co-operation with the mills, for the purpose of inducing students to undertake Paper Mill Work during the summer vacation, has been continued this year. The Industry will probably derive considerable benefit through having interested a number of college men to become engaged in the Paper Industry.

The Essays have already been passed on by a Committee of Judges for award of prizes by the Technical Section. On an average, the Papers are highly satisfactory.

"Training Men"—In recent years, the majority of our Paper Manufacturing Plants have been greatly expanded and improved. The Men have played an important part in this work, and have also aided in improving our methods of Pulp and Paper Manufacture. When the general education of the personnel of our mills is still further advanced by use of the Text Books, which are now nearing completion, we may confidently look forward to a still more rapid improvement in our Pulp and Paper Mill Practice.

We must continue to encourage intelligent, earnest and industrious young men to enter our Industry. For the past three years, as already pointed out, we have done this work to a limited extent, by employing, during the vacation period, a number of young men from the various colleges. Some of these have proved themselves most desirable men for the Industry, but the majority are no longer with us. The matter of training all around skilled men in the Industry is one of great importance to the future of the Canadian Paper Business. It will enable our young men to take a still more commanding position in the Canadian Paper Industry. It will add to the stability of the business, because trained men are more interested, contented and prosperous, than untrained men.

We can hardly expect our mill Superintendents and Technical Men to do much better than they are now doing, either in the matter of quality or production, unless the mill managers are willing to give better support and closer attention to the careful selection and training of a greater number of young men. It would seem that the time has now come for the Paper Industry to give serious attention to the development of a comprehensive system of apprenticeship, under which we may so train our young men in the Paper Business, that we will be the better enabled to turn out fixed standards of paper, in any quantity, at minimum cost. We must aim to successfully compete in any of the world's markets. Other paper making countries are training their men. We must do likewise, both for the welfare of the individual worker, and for the Industry as a whole.

May I suggest for the serious consideration of the Canadian Pulp and Paper Association, the appointment of a strong Committee for the purpose of planning a comprehensive Apprenticeship System, which may be sufficiently elastic to apply to the varying conditions in the different types of mills within our Industry.

GEO. CARRUTHERS.

Report of Joint Committee on Technical Research.

To the Officers and Members of the
Canadian Pulp & Paper Association.

Gentlemen:

Following the action of the last annual meeting of the Association at which your Committee were authorized to proceed with the initial steps in establishing a Research Department in connection with the Association's other activities, a careful survey of the then prevailing conditions in the industry was undertaken. Advice was also sought from the Executive of the Association. The plan, as outlined in our report last year, involved a considerable financial responsibility. It was also contingent, to some extent, upon the carrying out of the Government proposal for the establishment of a National Research Institute for Canadian Industries generally, our purpose being to work in co-operation with the proposed government institute.

In view of the depressed trade conditions which marked the beginning of the year and grew worse as the year developed, as well as to the uncertainty as to Parliament's dealings with the larger project, your Committee deemed it wise to postpone giving effect to their plans until the uncertainty was removed and until business conditions showed improvement.

The Act of Parliament creating the proposed National Research Institue was duly introduced at the late session. Our Association did what was possible in its support. The measure passed the House. It failed in the Senate, objection being made to it on financial grounds. The Committee understands that the Bill will be reintroduced at the coming session. They would urge upon the members the advisability of bringing to bear whatever influence is possible in favor of its passage.

Meanwhile your Committee begs to offer this as their interim report and to propose that their recommendations as made in their report of last year be reaffirmed by the Association and the Committee continued with instructions to carry on in accordance with their best judgment and with the advice and co-operation of the Executive Council.

All of which is respectfully submitted.

C. H. L. JONES,
Chairman, Joint Committee on Technical Research.

Forget past triumphs if they make you proud. Remember them if they make you strong. Forget past failures when the trumpet calls. Remember them when you are prone to boast.

British Trade News

There are not many signs of improvement in the paper industry yet, but it is rather early in the year to begin to review things. It is a good indication of an awakening to hear millmen asking the price of Easy Bleaching and Groundwood, but, beyond the Australian demand, there is not much passing beyond the usual supplies to other markets.

Commenting on trade and economic conditions, Mr. R. McKenna, formerly a Minister under the Premier, 'Wait and See'', (Mr. Asquith) stated in an address to the shareholders of the London Joint City Midland Bank—and he is reckoned as an authority— that we depend so greatly upon foreign trade that external conditions are a factor of first rate importance; so also are our labour conditions, which in a large degree determine the cost of production; and so, too, by its moral as well as its material influence, is the toll levied upon trade and commerce by taxation. "I will ask you to consider first the state of Europe, next our labour conditions, and lastly the burden of taxation. Our own trade cannot recover its pre-war activity whilst so many countries continue in their present broken down condition and though our plans to foster our export trade, by the grant of special credit facilities may be a palliative, the only lasting solution of the problem is, by the re-establishment of genuine peace and an ordered system of Government throughout Europe. It would have been desirable that in the Europe created by the Treaty of Versailles we should have found as good a market for our products as we had before the war. But our responsible representatives whose freedom of action was restricted by international considerations, could not have their attention solely directed to our trading requirements. The political necessities, which, regardless of economic needs, compelled the dismemberment of Austra-Hungary and the creation of a group of new states without any tradition of organised Government, must have been very powerful to permit a modification of the present settlement. If the economic needs of Europe were the primary consideration in international policy our course would be tolerably clear. We should recognise at once that modern industrial conditions have brought all countries into such close trading relationships as to make each an integral part of the trading world as a whole. One nation, and still more a large group of nations, cannot be broken up and impoverished so as to destroy its ability to function without throwing the entire machine out of order.'' Mr. McKenna instanced this by stating that if Russia fails to buy tea in China or India, The British market in eastern parts is narrowed down. If the U.S.A. and Canada sell to the British—they suffer and British shipping becomes impaired. These words of Mr. McKenna I quote specially, as they hit off —from a great financier —the true position that is playing havoc with the British paper industry to-day in the United Kingdom.

Unemployment.

It is estimated that 59,870 workpeople are employed in British papermaking and stainning, and according to the Ministry of Labour out of this total no less than 8.289 were unemployed, of which 5,924 represented males. In addition, short-time workers numbered 5,163, males being represented by 3,569. an addition of 179 over November. Now this is not a healthy state of affairs, particularly in an industry like paper.

United States Notes

The Hercules Paper Corporation of New York, with mills at Cornwall and Rock City Falls, and its subsidiaries, the Frank Gilbert Paper Company and the Union Waxed and Parchment Paper Company, went into the hands of a receiver last week on the application of creditors. It is alleged that the corporation's assets are approximately $3,315,487 and its liabilities, $1,190,509. The liabilities of the Gilbert Company are placed at $1,000,000 and its assets at $1,744,773, and the liabilities of the Union Company at $1,295,822 and assets at $1,589,768. Jacob L. Holtzman, attorney for the three companies, said: "The concerns have more than enough to pay all obligations and leave a substantial surplus for the stockholders. The continued depression in the paper market made it necessary for them to undergo new re-financing, and it was thought this could best be brought about in a receivership under the protection of the Federal Court.'' The company was organized in November, 1919, for the manufacture of newsprint and paper-boards products. Percival M. Wilds, a lawyer of New York City, was appointed receiver by Federal Judge Hand.

The annual report of the United States Envelope Company for the twelve months ended December 31, 1921, shows net profits of $728,154 as compared with a net of $2,275,697 for 1920. The company showed a deficit, after depreciation, dividends, reserves and other items of $474,699 for the year, and a final surplus, after adjustment taxes, amounting to $1,879,024. The final surplus, in 1920 was $1,736,236.

A suit for $113,000 in four actions, three for breach of contract and one for damaged paper, has been instituated by the Interstake Pulp and Paper Company against the New York Tribune.

The machine works of Trimbey & Allen at Glens Falls, N. Y. is to be known in future as the Trimbey Machine Works. The business has come completely under the control of E. J. Trimbey following the dissolution of the partnership of Trimbey & Allen. The company is now making the Allen & Trimbey automatic continuous mixing system, the Wells rotary sulphur burner, Trimbey & Tibbitts soft stock meter, Allen cooking control for chemical pulp, Trimbey automatic consistency regulator, Allen constant level stuff box and Trimbey pulp thickener. M. G. Tibbitts continues with the concern as sales manager, and T. A. Gastonquay as erecting engineer.

Charles W. Bell, who until recently was assistant secretary of the O. B. Andrews Company at Chattanooga, Tenn., has established an office at Dayton, Ohio, as a consulting specialist in the manufacture of paper box board, test board, fiber board and straw board and their fabrication into corrugated and solid fiber shipping containers, folding boxes, etc. Mr. Bell has been prominently identified at various times with leading boards manufacturing concerns through the Middle West, and he made several trips abroad to investigate markets and conditions. His new establishment is open for consultation in equipment, processes, formulae, trade customs, management, order and planning system, markets, sales, estimating, prices, contracts, materials, supplies, collections, valuations, etc.

Mr. Stewart Lansing, president of the Bagley & Sewall Co. of Watertown, N. Y., was in Montreal this week. Mr. Lansing has just returned from an extensive visit to England, France,and Italy.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. .Ligninsulphonic Acids. P. Klason. .**Zellstoff u. Papier,** i, 56, (May 1921). A discussion of the barium compounds reported by Honig and Fuchs (Monatsheft fur chemie, iii, 41, (1920).—H.E.W.

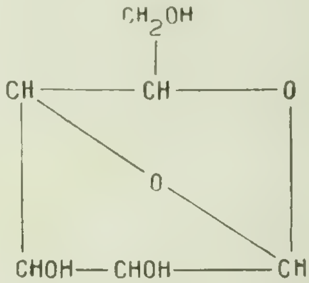
A-1. Incrusting Matter and Mercerizing Liquor. Schwalbe and Becker. **Zellstoff u. Papier,** i, 93, (July 1921). In determining alpha-cellulose pentosan constituents are dissolved out at the same time and the remaining cellulose is not completely stable toward caustic. In handling wood cellulose with strong caustic the pentosan content decreases and also the methyl content.—H.E.W.

A-3. Hemp Wood as a Paper Making Material. B. Rassow and A. Zschenderlein. **Z. angew. Chem.,** xxxiv, 204-206, (1921). Abstracted by Clarence J. West in **Paper Trade J.,** lxxiii, 46, (Oct. 13, 1921). Data on the cellulose content of hemp wood as determined by various investigators are given. Digestion of the wood by water gave pulp suitable for kraft and when caustic was used the pulp contained large amounts of pentosans (20 percent) but the amount of pentosans in the pulp obtained by the sulphite process was 10 percent. (The Ritter - Kellner process is the best).—H.E.W.

A-12. New Constituent of Rosin. Papers Travaru Industri., No. 7, April 15, 1921. Pine resin contains a hitherto unknown acid of undetermined composition called by the author **colophenic acid.** Various samples of rosin contained 2-4% of it. It is stronger than resinic acid and its sodium salts are readily soluble in water, while those of resinic acid are almost insoluble. Pure colophenic acid is pale yellow or colorless, but impure samples are yellow to red, or brown. Technically the acid and its salts are important, since they impart a brown color to paper during sizing. Colophenic acid is an amorphous powder with a melting-point of 100°C. It is monobasic. The brown color of commercial rosin is due to this substance, the darker the color the greater the amount of colophenic acid present. It dissolves in sulphuric acid to an orange yellow color, which in a few minutes changes to yellowish or blood red. In concentrated hydrochloric acid it dissolves to a dirty yellow color.—P. B.

A-14. .Testing Filter Paper. Anon. **Zellstoff u. Papier,** i, 61, (May 1921). In the Herzberg apparatus 100 cc of distilled water at 20°C passes through 10 sq. cm. of the paper under a pressure of 50 mm. In unit time the amount of water running through a given paper is inversely proportional to the viscosity of the water, for which Thorpe and Rodger's values are given. The temperature of the water is an important factor.—H.E.W.

A.-15.. Studies on the chemistry of Celllulose. I. The Constitution of Cellulose.— Harold Hibbert, Dept. of Chemistry, Yale Univ., New Haven, Conn. **J. Ind. Eng. Chem.,** xiii, 256-260, (March 1921), 334-342, (April 1921). The author reviews the formulas proposed for cellulose by Tollens, Cross and Bevan, Vignon, Green, and Barthélémy, showing wherein they fail to account for various experimentally acquired facts. He then proposes the following as the formula of the cellulose nucleus:



and shows how it accounts for the following facts: (1) The highest stage of nitration of cellulose (calculated on the C_6 formula) is the trinitrate. (2) The highest acetylation product (contrary to the views of Cross and Baven) is the triacetate. (3) Cellulose forms with concentrated sodium hydroxide a sodium compound, which is decomposed by water, leaving the cellulose as a hydrated product. In this latter form it is much more readily soluble in a solution of zinc chloride or ammoniacal copper sulphate. (4) On treatment of the sodium derivative of cellulose with carbon disulphide a cellulose xanthate is obtained which is readily soluble in water. This product is very unstable and is decomposed by acids, acid salts, ammonium chloride, or heat, with regeneration of a hydrated cellulose. (5) Cellulose does not react with phenylhydrazine or with hydroxylamine; therefore, apparently does not contain free carbonyl (aldehyde or ketone) groups. On the other hand, by subjecting it to simple hydrolysis, derivatives containing free carbonyl groups are obtained. (6) Cellulose yields devtrose as the end product of hydrolysis (for example, with sulphuric acid.) (7) Cellulose yields omega-bromomethyl furfuraldehyde on treatment with hydrobromic acid in ether or chloroform solution. (8) The oxidation of cellulose gives oxy-cellulose, a body of marked acid character, which yields furfuraldehyde on distillation with hydrochloric acid. (9) On heating oxycellulose with calcium hydroxide, isosaccharic and dioxybutyric acids are formed. (10) The nitrocelluloses when treated with dilute caustic soda yield hydroxypyruvic acid. (11) Relation of cellulose to the cellulose nucleus. (12) The formation of 1, 2, 5-trimethyl glucose and the absence of a tetramethyl derivative by the action of dimethylsulphate and subsequent hydrolysis of the methylated product (Denham and Woodhouse). (13) The formation of dextrose and cellobiose by the hydrolysis of cellulose acetate. (14) The production of levoglucosan by the action of heat on cellulose, starch, and beta-glucose under diminished pressure. (15) Formation of omega-hydroxymethyl furfuraldehyde on distillation. (16) Action of metallic salts such as zinc chloride. (17) Formation and properties of hydrocellulose and cellulose hydrates. (18) Action of acids. (19) Relation of cellulose to starch and dextrose and the problem of plant metabolism.—A.P.-C.

R-6. Use of Lime Wastes for Fertilizer. Lecher. **Papierfabr.,** xix, 965, (1921).—**H. E. W.**

PULP AND PAPER NEWS

One of our American friends left a silk scarf in the Green Room at the Ritz during Paper Week—no, that was'nt the reason. Any way, there is a five dollar bill in it for the person who is fortunate enough to return the scarf to the editor.

C. Davidson & Sons, Ltd., one of the Scottish mills, report that there has been a great slump in the prices of all papers made by the firm.

Mr. Guy Tombs has been appointed chairman of the committee of management of the Transportation Bureau of the Montreal Board of Trade.

Mr. W. Gerard Power, an active member of the Woodlands section of the Canadian Pulp and Paper Association, has been appointed chairman of the Harbor Commissioners of Quebec.

Mr. J. McNicol, of Toronto, late assistant paper controller, will shortly sail for Siam for the purpose of building a pulp and paper mill for the government of Siam.

Mr. G. F. Steele, who recently returned to Montreal from New York, sailed this week for a two months' visit to Europe. He will spend part of the time in Scandinavia.

KAMINISTIQUIA PLANT SOLD FOR $175,000

Port Arthur, Feb. p0.—The estate of the Kaministiquia Pulp and Paper Company consisting of a fully equipped and ready to operate ground wood mill and sixteen acres of land on a ninety-nine year lease from the corporation of the city Port Arthur, was to-day sold at public auction to the Consolidated Water Power and Paper Company of Wisconsin Rapids, for $175,000.

George P. Berkey, vice-president and general manager of the Consolidated Company was the only bidder. He opened with a bid of $150,000, which was increased to $160,000 and finally to $175,000.

The plant of the Kaministiquia Pulp and Paper Co. was constructed at an estimated cost of $450,000. It was opened in January, 1921, and operated for three months. U. M. Waite, of New York, was the president and general manager.

The mill was supplied with wood from the Point Magnet and Hele township limits.

EXPECTS LOWER WOOD COSTS.

O. Auger, general manager of the Auger, Rancourt Lumber Co., told the Quebec Telegraph that the labor costs of peeling lumber for pulpwood were as high as six and seven dollars a cord in 1919 and 1920, but that in 1921 they had decreased to $3.50 a cord. 'In fact I can tell you that in some instances peeling was done at the rate of two dollars a cord during the season this past six months,'' said Mr. Auger. ''This was in the Metapedia Valley where 12,000 cords were cut at this price. It is interesting to note that in that valley the farmers alone cut 50,000 cords of pulpwood last year. The 12,000 cords of wood, however, were cut by a large contracting company.''

''It is our belief that the costs of peeling this kind of timber will be reduced to the general level of two dollars a cord by the end of the coming season.''

CANADA'S FIRST BURR MANUFACTURING PLANT.

The F. W. Roberts Manufacturing Co., Inc., of Lockport, N. Y., announces the completion of their Canadian plant at Niagara Falls, Ontario, for the manufacture of burrs for the pulp industry. Most of the machinery for the new plant is already set up, and the furnaces are well along toward completion, the plant to be producing March 1st.

This new move will enable the ground wood mills of Canada to secure burrs made in Canada at prices which will compare favorably with imported goods, and at the same time get prompt delivery on all orders.

KILBERRY AND CORCORAN COMBINE.

The latest entrants in the field of Consulting Engineers are Geo. D. Kilberry and John C. Corcoran, who have opened an office in Room 711 Drummond Bldg., Montreal. The magic figures seven - eleven and the monogram K—C on the door should be a good omen to those who believe in signs. But apart from that,the knowledge and experience of these men will doubtless inspire sufficient faith and confidence in their established ability to keep them busy with their chosen line of work—designing special machinery, selecting and improving equipment and extending a general engineering service to those in the industry.

ELECTRICAL PYROMETERS.

At the Donside paper mill, Aberdeen, Scotland, Mr. Strachan states there is a very fine installation of recording electrical pyrometers in connection with the raising of steam plant. There was one instrument which records four temperatures on one chart, thus placing the engineer in a position of knowing in the office more of what was going on than if he was standing in boiler-house—because he could not be in four different places at the same time. The electrical pyrometer, he mentions, was the only convenient and accurate method of deterning the melting-point of minerals, and for the paper mill it was costly, but resulting economy more than paid for it.

ABUSING THE STARTING BOX.

The practice throughout the plant of jabbing motor starters onto the starting position and then quickly releasing the handle in order to partly turn over a motor is a very bad practice, sometimes a dangerous arc is started which the oil in the starter does not quench and someone is usually burnt from the arc from the starter fuses. A bad short circuit is sometimes caused in this way and possibly the electrician who puts in new fuses does not actually know the nature of the trouble and may also be injured in case of trouble.

A good book is a good friend, always at hand when one wants it. The Book of books is the best of all.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, February 22.— Nearly two months of the year have passed, and it may not be out of place to survey briefly the events of that period as they affect the pulp and paper industries. Although there has been no pronounced revival either in the volume of business or in prices, the markets have, taken as a whole, shown an improved tendency. The fine paper and book mills are fairly well employed, the orders being, as a rate, for small quantities: they are however more numerous, with many of the rush description. The jobbers state that trade is slowly picking up, and that the buying is mostly of the hand to mouth description. Other lines report a moderate business.

The newsprint situation continues to gather strength. German and Scandinavian competition is less keen than it was, and Canadian mills are receiving additional proof that old customers are anxious to again turn to the Dominion for their supplies. Some of them have discovered that it is one thing to contract for newsprint at low prices and another thing to have these contracts filled. Price is not everything—a reliable and continuous supply has to be considered. The Germans have fallen down in several instances, and in view of the general strike are likely to fall down still more.

The experience so far this year goes to show that the pulp and paper trades are likely to have a satisfactory twelve months' business. Even pulp is picking up a little. To use the words of Mr. Arthur Surveyer, of Montreal, in discussing the general situation, the banking situation has improved, and the note circulation as well as the current loans, without too great a reduction in the savings deposits. The balance of trade is once more in our favour, and the premium on American money has fallen in twelve months from ten to below 3 per cent. One of the most favorable signs has been the rise in the bond market both in the United States and in Canada. In Canada, both the Government and municipal bonds are selling several points higher than 12 months ago, and the 5½ per cent. coupon has once more appeared on the scene. This means that in the near future the investors who are no longer satisfied with the reduced return offered by public securities will once more give the help of their funds to the better class of industrial and commercial enterprises.

As Toronto Sees It.

Toronto, February 18. — It will be a matter of interest to note whether the man who cuts pulp wood this winter, will not have one over the man who does not. With the present small cut and the indications of increasing output from the mills it might be better policy to cut now even with stocks on hand.

Annual reports of Interlake Tissue and Provincial Paper coming out at meetings held this week, show that while there had been some curtailment of net profits, all obligations had been met and surpluses carried forward. Few industrial concerns have a larger goodwill factor in the persons of their executives, and no doubt the very satisfactory showing, in spite of the conditions obtaining through 1921, is in large measure a product of the goodwill and confidence of the market supplied by their mills.

The commendable behaviour of paper stocks on the Toronto exchange during the last couple of weeks reflects some renewal of confidence in the industry. In the case of Abitibi, whose common rose from 30 to 33 bid, the situation led to street gossip of a possible dividend at about 4 p.c.

There is no feeling of overconfidence but the continued firmness of quotations and general steadiness disclose a feeling of optimism in all lines, especially paper stocks.

Prospects for spring trade are good if inquiries can be relied upon to any extent as a trade barometer.

Mills are not carrying heavy stocks as a general thing. Any pronounced increase in demand would, therefore, tend to marked activity.

It is considered not improbable that the rise in sterling exchange, and the reputed large amount of idle money in the United Kingdom, will lead to increased interest in Canadian industrials. In this case the pulp and paper industry should benefit to some measure.

Pulpwood, groundwood, sulphite and **newsprint** show no change over last week.

Book and **writing** mills are running at about 80 p.c. of production and on a full time basis.

Bristols, covers and **tags** are sustaining a slight slackening of bookings, but with no diminution of the firm price conditions.

Wrappings, bag and **tissues** are steady. Orders suffer from lack of volume, but the jobber shows material improvement in steadiness.

Wrappings. — Natural kraft is 8¼c per pound and colored kraft 9¼c. The price for No. 1 manilla is 7½c and for B Manila 5¾c. Fibre Manila 7¼c and 5¼c. Prices for bags are unchanged and the market is without feature.

Tissues And Toilets.—Mills making these lines have bookings ahead and are quite busy. The following prices rule at present: No. 11 Manilla 20 by 30, ing prices rule at present: No. 11Manilla 20 by 30, .85; 24 by 36, 1.15. Natural white 20 by 30, .95; 24 by 36, 1.35. No. 1 Prime white 20 by 30, 1.25; 24 by 36, 1.75. White sulphite 20 by 30, 1.10; 24 by 36 1.55. Less 32½. The prices of towels are $6 per case for interfolding and $15.25 for rolls less 22 per cent.

Paper stock dealers report inquiries on all grades of paper stock much improved. One dealer says "Most of the Canadian mills are in the market for fair sized tonnages, and it is indeed difficult to supply demands from local sources. No. 1 Soft White shavings have been moving freely at quoted prices, but a little difficulty has been experienced in securing orders for hard white shavings and kraft at prices asked by dealers. Book mills are coming into the market for additional supplies of old books. Indications all point to a fairly brisk spring business. Roofing rags are moving in fair volume with a limited demand for bagging.

New cotton rags continue slow with very little prospect of any large increase within the next month or so.

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INQUIRIES SOLICITED:

Paper Stock.	Price asked	Tendency
No. 1 Hard White Shavings	$3.75	$4.00 up
No. 1 Soft White Shavings	3.25	3.50 up
Heavy Books and Magazines	1.65	1.70 up
Lodgers and Writings	2.10	2.20 up
No. 1 Kraft	2.25	2.30 up
Newspapers	.75	.80 up
No. 1 Mixed Papers	.60	.65 up
Cotton Rags No. 1 Whited	5.00	5.25 inch.
Thirds and Blues (repacked)	1.75	1.85 up
Roofing Rags	1.10	1.20 down
New Cotton Cuttings		
No. 1 White Short Cuttings	8.50	9.00 inch.
Fancy Short Cuttings	4.50	4.75 down
Canton Flannels bleached	6.25	6.50 down
White Lawns	7.75	8.00 inch.
Blue Overall Cuttings	4.75	5.00 down
Ropes & Bagging		
No. 1 Scrap Bagging	.65	.75 inch.
No. 1 Manilla Rope	4.00	4.25 inch.
Mixed Strings	.70	.80 up

NEW YORK MARKETS.

New York, Feb. 18—(Special Correspondence)—Improvement in demand for paper continues to be slow, and while the market as a whole is in a quiet position, proof is not wanting that some kinds of paper are moving in gradually increasing amounts. Consumers are still buying merely to cover direct requirements, it being stated that conditions in the consuming trades are such as to warrant a cautious policy in laying in supplies, and paper jobbers also are placing orders with mills only to supply actual commitments to customers. Probably one of the bullish factors in the industry at present is that jobbers' stocks of paper are at a low point. Paper merchants frankly admit that they are keeping their holdings down to as low a level as they dare, not because they expect to be able to obtain paper from mills at any materially lower prices in the future but mainly because matters in their own trade are characterized by so much uncertainty that they do not feel justified in augmenting their stocks. It goes without saying that sooner or later paper merchants are going to begin to lay in stocks to something approaching normal, and when they do mills will suddenly be blessed with a large batch of orders all at once. It is also quite likely that printers and other large consumers will soon commence to put in stocks, which will lead to additional increased business for paper manufacturers. Prospects in the paper trade therefore are very favorable though, as emphasized by prevailing conditions, it will take time for the improvement to develop. Figures issued this week by the News Print Service Bureau are quite encouraging. The 46 companies reporting to the Bureau produced 174,807 net tons of newsprint and shipped out 174,247 tons in January, compared with 167,839 tons produced by 44 reporting companies in the preceding month. The average daily production of newprint by the mills reporting in January amounted to 84.1 per cent of the average daily output during the three months of greatest production in 1920 and 1921, with allowance for new machines. Production by United States mills in January was 13,835 tons or 13 per cent less than during the same month of 1921, while production by Canadian mills in January was 9,900 tons or 14 per cent greater than in January, 1921. Total production of the 46 reporting companies in the U. S. and Canada during January shows a decrease of 3,935 tons or but 2 per cent when compared with January, 1921. Mill stock in January increased 2,699 tons at United States mills and decreased 2,169 tons at Canadian mills. Total mill stocks on January 31 were equivalent to 4 days' maximum output.

The movement of newsprint into consuming channels continues at a fairly active rate. Publishers are taking commitments on contract regularly and are frequently coming into the market for additional supplies. Reports say that less and less print paper is coming into the American market from Germany and other European sources. Two reasons are chiefly ascribed for this, one being that prices on newsprint in the United States are now at a point where the American market does not hold the attraction for German producers that it did some time ago, and the second is that Germany is shipping more paper to South American countries, thus reducing the supply available for export to this country. Moreover, the German Government is reported to have placed restrictions on the exportation of print paper, and this probably has something to do with the smaller shipments to America.

Wrapping papers are in a quiet market position. Reports are to the effect that quite some kraft wrapping is being imported from Sweden, which is creating competition for domestic producers here and also making for easiness in prices. Leading domestic manufacturers are quoting 7.50 cents a pound on No. 1 kraft wrapping but jobbers report purchases at a good deal under this price level. Tissues also are in slow demand and quotations are tending downward. Fine papers are moving in more or less routine volume with signs pointing to a gradual increase in demand, while prices

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Safranine B.S.
Safranine R.F.F.
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Methylene Violet 2B. conc.
Malachite Green Crystals.
Methylene Blue B.B. conc.
Methylene Blue 1814.

NEWS BLUE

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Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.

Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
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Paper Black 3181

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hold at about last reported levels. Book papers are in limited demand. Publishers are buying simply to satisfy immediate needs and some book mills are badly in want of orders, with the result prices exhibit a weakening tone.

Box boards are showing slightly more life and are wanted in at least a little larger volume by paper box manufacturers, and board producers are maintaining prices even though they have to curtail production to do so.

GROUND WOOD—Mechanical wood pulp has experienced one of the quietest weeks that have been noted in a long time. Demand from consuming quarters has eased off to a marked extent, the apparent reason being that paper and board mills have not needed as much pulp and therefore have let up in their buying. Quotations have undergone no important change though the trend is in a downward direction. Delivered consuming point prices range between $40 and $42 a ton, on an average, for prime spruce ground wood for prompt shipment, while f.o.b. grinding mill quotations are from $27 a ton upward, depending on the length of the haul to consuming plants.

CHEMICAL PULP—There is little fresh trade activity of note in chemical pulp. Papermakers are coming into view as buyers actually in need of supplies and are mostly confining their orders to amounts necessary to cover direct requirements, with the obvious result that transactions generally involve rather small tonnage. Sulphite is holding its own in price notwithstanding the falling off in business, but kraft pulp has weakened slightly. Scandinavian kraft of No. 1 quality on the spot in this country has sold at 2.65 cents a pound ex dock, and No. 1 domestic kraft is reported available down to 2.75 cents though the foremost producers are said to be still quoting 3 cents. Soda pulp also is easy, and while 4 cents per pound constitutes the price asked by manufacturers, most purchases are said to be at lower levels.

RAGS—Other than business in the low grades for roofing paper purposes, there is a lack of important activity in papermaking rags. Felt mills are absorbing rag supplies in a fairly steady manner, which, in company with the severe snow storms throughout the country holding up collections of rags, make for a firm price tone in this class of rags. No.1 roofing stock is freely fetching 1.15 to 1.20 cents per pound at dealers shipping points, and No. 2 packing is selling at an average of 1.05 cents. Old whites are accorded some attention by paper mills, with dealers quoting around 5.75 cents for No. 1 repacked whites, and between 5.25 and 5.0 cents for No. 1 miscellaneous packing whites, while occasional sales of new No. 1 white shirt cuttings are reported to paper mills at an average of 9.75 cents per pound at shipping points. Old blues are dull, and most grades of new cuttings are in slow demand.

PAPER STOCK—Old papers rule firm in price notwithstanding reports to the effect that some of the large consumers have let up in their buying to an extent. One apparent reason for the strength in waste paper values is the heavy snowfall, which has severely handicapped collections in gathering paper, while production of certain of the high grades of waste paper, such as white shavings for instance, is at a low point, which serves to sustain prices on such grades. Old No. 1 mixed paper is finding a fairly ready outlet among box board mills at an average price of 47½ cents a hundred pounds f.o.b. New York, and old folded newspapers are selling at 60 cents a hundred pounds. White shavings are quoted by dealers at around 4 cents a pound New York for No. 1 hard and an average of 3.35 cents for No. 1 soft shavings. Old kraft paper is holding at about 1.90 cents per pound, white blank news cuttings at 1.85 cents, No. 1 heavy flat magazines at 1.45 cents, and box board cuttings at 55 cents a hundred pounds.

OLD ROPE AND BAGGING—The movement of old rope toward paper mills has slowed down considerably and current quotations of dealers range between 4.25 and 4.50 cents per pound at shipping points for No. 1 domestic manila rope, whereas foreign rope can probably be bought down to 4 cents. Old bagging is in quiet demand and prices are quite uncertain though No. 1 scrap bagging is freely available at $1 a hundred pounds.

REDUCED FARES TO PAPER CONVENTION.

The American Paper and Pulp Association has been able to secure a reduced railway fare for its members who attend the Forty-fifth Annual Convention at New York the week of April 10. In addition it has been possible to secure the reduced fare for the wives of members, or others of their families. The reduced fare is one and one half fare for the round trip, but in order to secure the reduced rate it will be necesary for those attending to secure the standard form of certificate from the agent from whom the original ticket is purchased. This certificate will then be signed by an Association officer, and when validated by a representative of the railroads, will be accepted for half of the return fare.

The securing of the reduced fare for those attending the convention is the latest step taken in the effort to make the Forty-fifth Annual Convention the best that has ever been held by the Association.

The special rate has been definitely authorized by the Trunk Lines Association, New England, Central, Western, Southwestern, and Southeastern, and Canadian Passenger Associations.

T. A. P. P. I. PROGRAM.

The Seventh Annual Meeting of the Technical Association will be held in New York beginning Monday, April 10, 1922, in conjunction with the meetings of the American Paper and Pulp Association.

The contemplated arrangement is as follows:

Monday, April 10 Meetings of Executive Committee and Standing Committees.

Tuesday, April 11—First general session; Reports of officers and committees.

Wednesday, April 12—Second general session; Discussion of committee reports and special papers; Election of officers; Continuation of papers and discussions.

Thursday, April 13—Completion of T. A. P. P. I. program.

HAS CANADIAN OFFICE ALSO.

Mr. H. S. Kimball M. AM. SOC. C. E. Mill architect and Consulting Engineer has removed his office to 177 State Street, Boston. Mr. Kimball announces that Mr. Harold A. Piper, Chemical Plant Engineer will in future be associated with him. Mr. Kimball is well known to the pulp and paper industry in Canada and maintains a Canadian office with Messrs. Staveley & Hadley, 285 Beaver Hall Hill, Montreal.

Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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Graton & Knight Leather Belting
Yale Chain Hoists
Esterbrook-Allcard High Speed Drills
Fairbanks-Morse Motors
Gould's Pumps
Roberts Pulp Stone Burrs
Durabla Packing
Foster Regulators
Claflin Beaters
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:-: EDITORIAL :-:

SUPERINTENDENTS AND THE TECHNICAL SECTION.

There was time not so long ago when it was generally considered that the term "technical man" applied only to the engineer in the drafting room or the chemist in the laboratory and the term "practical man" applied only to the man who filled the digester and regulated the steam pressure or furnished stock to the beater or operated the paper machine. The superintendent felt that the technical man was of little use to him or to the mill, they apparently had but little in common and the technical man often felt or assumed that his educational advantages gave him certain prerogatives to which he was really not entitled. Under such circumstances it was not to be wondered at that there was more of a gap than a connection between the operating man and the technical man. Such a condition, fortunately for both the men and for the industry, is largely passing; the technical men are becoming operating men through experience in the mill and operating men who have not had the maximum of educational advantages are becoming technical men through the application of common sense, thought and study to their tasks and through cooperation with the college men in the solution of mill problems. The two groups of men who have been more or less separated by virtue of their difference in training are coming closer and closer together through mutual contact, cooperation and appreciation, and mill managements are coming to recognise the need of both technical training and practical experience in the successful operation of the plant.

A number of years ago, the Technical Section of the Pulp and Paper Association was formed, many of the members already belonged to other scientific societies and it was natural and easy for them to form an organization related to the industry with which they were all connected. It was early recognized in the work of the members of the Technical Section in advancing the paper industry through the solution of problems connected with the manufacture of Pulp and Paper, that cooperation of the operating staff was a neccessary factor. Some superintendents have been members of the section from its very beginning and this number has constantly increased. This is an excellent sign of progress and should be heartily encouraged by the mills. The Technical Section has endeavoured to arrange programs which would include papers of direct interest to the superintendents and to the discussion of which they could contribute from their extensive experience and to include such papers of a more technical character as would acquaint the operating man with the problems of a more scientific character whose solution would contribute to more economical production and more efficient utilization of equipment and resources.

For a time, membership of operating men in the Technical Section was provided for by admitting non-graduates as associate members. There had been from the beginning some opposition to this classification and the matter has been the subject of frequent discussion at meetings of the Technical Section. This resulted some time ago, in a re-classification of membership whereby it was provided that superintendents would be admitted to **full** membership if in the opinion of the council their experience met the qualification requirements. It is now distinctly the feeling of the Technical Section, that superintendents should feel they rightly belong and at the last meeting of the Executive Council it was unanimously resolved that in the opinion of the council a man who had worked up to the position of superintendent and had served as such for a period of three years, was fully qualified for and entitled to, election to **full membership** in the Technical Section, on application. The industry is too much dependent upon the complete cooperation of every employee both for operation and advancement to permit of, any such discrimination as has been assumed to exist in past years. There is no reason or excuse for such a feeling and we feel sure that the superintendents in our pulp and paper mills will not only apply generally for membership in the section, but will cooperate just as heartily in its activities as they do with the various members with whom they are associated in the work of their mills. The superintendents have a wealth of knowledge from their experience which if brought out in discussions at our meetings, and supplemented and extended by the mutual exchange of knowledge and ideas among this mixture of employees, would add materially to the working capital of knowledge which all would derive benefit from.

It is the earnest desire of the Pulp and Paper Magazine to be of any service to the industry, and, as official organ of the Technical Section, extends a very hearty invitation and welcome to any superintendents who may not already belong to the Section, to apply for membership. There is no doubt but that each one will derive great benefit from belonging to this organization and will have the satisfaction of contributing a little now and then to the progress and prominence of the industry.

COBWEBS.

The Pulp Press, the organ of Hydraulic Machinery Co., Ltd., devotes its February number to the annual meeting of the Canadian Pulp and Paper Association. There are a number of very good pen sketches of a number of those present at the meeting. One of chief Donnacona, alias G. M. McKee, is particularly good.

Our congratulations to Mr. J. A. Decew, who is in Bermuda on his honeymoon.

LETTER TO THE EDITOR.

A prominent forest engineer writes to the Pulp & Paper Magazine, as follows: Referring to your editorial "Is it worth it?" in the Pulp and Paper Magazine for February 16th, I wish to express hearty agreement with your statement as to the necessity for accurate and reliable crusing and estimating of the forest. Timber cruising is not and never will be an exect science, but partakes of the functions of an art, in that experience, judgement and the natural gift must play their parts.

As to the over-run between estimates and cut of which you speak, I feel that in the majority of cases this should not be attributed to dishonesty on the part of the cruisers. Understand that I strongly think honesty to be the most important requisite a cruiser has—without it he is not only useless, but dangerous. In my experience of over 20 years, however, the really "crooked" estimates I have seen have been comparatively scarce; at the same time I have seen many honest estimates which have cut out much more than the figures passed in when the cruise was made.

The reason for this is plain. Cruising was first done to arrive at a value on which purchase could be safely made. Value of timber units was low; so were prices of timberlands. The cruiser's main idea was not to over-estimate. It was thought better policy for a piece of land to slip by purchase than for it to be bought on an over-estimate. Cruising was of course of the roughest nature, all visual, no measurements, areas often not known. The cruiser had to be conservative to avoid mistakes.

From this developed a cruiser psychology which still remains, viz: "I will get as near the true quantity as I can, but I must not be too high. If I am in doubt I will always throw off, not on." You would be surprised to see the number of times the word "conservative" is used in the letters of recommendation we get from our clients. That is considered a primary qualification.

Another cause of small estimates is the change in utilization from saw-logs to pulpwood. Take an estimator who has been brought up from boyhood in saw-log operations, and to whom pulpwood is a camparatively new thing, and it is extremely hard for him to realize the new quantities which are made available by closer cutting.

Finally, one should analyse the amount of time and money usually allowed the cruiser in making an exploration. That he has been inaccurate is not a wonder—that he has done as well as he has is the miracle It, to my mind, speaks pretty well for the profession, often up against hardships and difficulties, and endeavoring to render as close results as it can, with but the most scanty time and cash allowance.

We have done considerable of this rough estimating and I can best give you an idea of what we have been called on to do by quoting a few instances. (1) Cruise 80,000 acres in 3 days and wire in the report. (2) Cruise 200,000 acres in 36 days. (3) Cruise 60,000 acres in 6 days. (4) Cruise 250,000 acres in 30 days. I could quote many more of the same kind. But here is an average of 8,000 acres per day, and even if several men are thrown together on each tract the work must necessarily be superficial. Even with an organization and well thought out system, such as we have, and with men expert in determining area, I am very frank to confess that such work must be of the roughest sort. We always caution the cruiser, however, not to overestimate, which brings us back to the psychological factor above written of.

Timber estimates are based on a percentage of area actually seen, and, in careful work, actually measured. Sometime 2% is measured, sometimes 5%, sometimes as high as 20% or even in very rare cases, on small lots with a heavy stand 100%. The ordinary Canadian estimate made with detail covers only from 2% to 5%. Such estimates cost comparatively little per acre or mile but of course far more than reconnaissance work. In our own case we have had detailed estimates cut out to within as close as 5% of the estimate, but we consider that a 10% error, even in very detailed work is allowable, and then that it should be on the low side, nor do we claim that in ordinary work one should be dissatisfied with an estimate running over 80% correct.

I hope you will pardon the length of this letter which grew longer in writing. I suppose I am some what of a crank on timber estimates and estimators, but I know the physical and mechanical difficulties with which they have had to and still do contend.

Yours very truly,
James W. Sewall.

JWS K

TECHNICAL SERVICES OF THE F. P. L.

No. 1, Identification of Woods.

The Laboratories are frequently requested by manufacturers and others to identify samples of Canadian and foreign woods. Identification is made possible by an expert knowledge of the minute structure of woods as revealed by the microscope. Special methods of preparing the material for examination are also necessary.

The Laboratories are prepared to examine without charge any samples submitted. Such samples should be accompanied by a statement as to the country of origin. In the case of North American woods the district of origin should be stated if possible.

The world takes off its hat to the man who *does* things, while it has only a smile of contempt for the chap who is always *going to do something*.

MR. KELLOGG: As I understand, the estimate—and it was simply a shot in the dark made three years ago, because it could be nothing else — was that the work would cost $30,000, of which $10,000 was to be raised in Canada by assessment and $20,000 in the United States by going out and begging for it. That has been done. That $10,000 of the Canadian fund has been raised and spent. We have, by a process of appealing and begging, raised in the United States $22,500. The plan was that there should be $10,000 more raised in addition to the $30,000—$5,000 on this side of the line and $5,000 on the other. If the assessment is passed for $5,000 here we will have to get $5,000 more over there. We have got part of it already as a matter of fact.

MR. CARRUTHERS: You have heard the motion which has been duly seconded. All those in favour signify in the usual manner.

Motion (Mr. Mason) declared carried.

(In the next issue, the discussion of this report will be printed, including information on the present status of this work and plans for carrying on the organization of vocational education.)

A VISIT TO MILLS IN NIAGARA DISTRICT.

Your correspondent has been in the St. Catharines district for a couple of days. Leaving Toronto in the icy grip of Wednesday's sleet storm frozen tighter Thursday morning, we bumped down Yonge St. to the Union Station in a taxi of the Elizabethan type, noting the street car crews marooned in their motionless cars, and wondered if they were the same men we had passed in our four mile tramp homeward the previous night.

The first man we called on was Superintendent W. C. Anderson at the Kinleith mill. "Billy" was slated to appear in review order in the minstrel show incidental to the Rotary Club's 17th anniversary, for which he was mentioned in dispatches in to-day's "Standard". The Kinleith mill has been running full time for some time past and is now up to about 80 per cent production, with several interesting orders, one taking a large proportion of rag. The machine room looked as if visitors were expected but we found this was the normal appearance now.

We had next an opportunity to discuss educational matters with Mr. C. T. McBride, the secretary-treasurer of the St. Catharines Board of Education getting from him some ideas as to development of vocational work in the new building which is to be erected in the fine site of the Riordon home on Geneva Street. St. Catharines is the logical centre for industrial education in that district and makes provision for outsiders on a pro rata basis.

St. Catharines might supply teachers for special work at the mills if adequate class rooms could be provided.

Next morning we dropped in at the Lincoln mill, G. J. Armbruster former superintendent had left about a week ago for his new work at the Fraser Company's mill at Edmunston, New Brunswick, so we had not the pleasure of wishing him Godspeed. We had instead the privilege of becoming acquainted with A. G. Natwick his successor who comes from Jenssen staff, obtained his experience in the mills of the Nekoosa Edwards Company and later at Howland Falls, Maine. The Lincoln mill is turning out both natural and bleached pulp, working five and a half days a week at about seventy-five per cent production. Their bleaching is done by the use of liquid chloride, chlorinating milk of lime in towers. This system has been in use for over a year and has been found very satisfactory.

Striking Merritton station at 10.45, we were able to take the Port Colborne train to Beavers where we found the Beaverboard mill running full time at capacity and Mr. Robertson, the superintendent, interested in the matter of a foreman's conference class. If nothing checks the building business there should be good times at Beavers this Spring.

We had a chat with Mr. Joseph Battle, Mayor of Thorold, who has a stake in the paper industry as principal owner of the Dextrine Co. of Thorold(selling gums and pastes which are largely used by book binders and paper mills.) His most recent interest is in a special engine size which has not yet been advertised but is being tried out in a couple of mills. It is expected that this will produce a better formed, better finished and stronger sheet with less broke. Results so far are encouraging and Mr. Battle hopes to develop good business in this line.

Dropping in at the Montrose Mill of the Provincial Paper Mills we were just in time to hear Mr. T. A. Weldon tell a good yarn and to hear Dan Daverin's hearty laugh. This mill is running full time and capacity on book, catalogue, and rotogravure papers.

At the Interlake Mill "Pete" Rausch was enthusiastic over his work on the new machine, especially towels. Business here was near capacity and well booked ahead in nearly all lines.

We went down to the station with a feeling that we had sojourned briefly in the isles of the blessed.

The industries in the Toronto district were affected seriously by the sleet and ice storm of the 22nd and 23rd. All but one of the Niagara transmission lines being down. The Don Valley Paper Co. was doubly hit. A severe rain storm last Sunday caused a sharp rise and flood in the Don river and the mill was compelled to shut down with water rising to the level of the machine room floor. Then Wednesday's storm cut off their power, leading to a loss of three and a half days this week.

The Barber division of the Provincial mills at Georgetown were also closed down for power by the Wednesday storm.

Mr. A. P. Costigane, Secretary and Engineer of the Ontario Pulp and Paper Makers Safety Association is moving this week to his new office in the Aladdin Building, 208 King Street west, Toronto. Where he will be a close neighbour of the Pulp and Paper Magazine. His office being one of the suite occupied by the Industrial and Educational Publishing Co.

NEWSPRINT INDUSTRY SOUND.

Mr. George Chahoon, jr., was in the city Tuesday en route to Florida to join his family. He spoke very encouragingly of the newsprint industry, saying that he believed that the low point had been reached last autumn; there had been a steady improvement during the last few months and it looked to him as though the newsprint part of the industry is now on a sound basis, and it was reasonable to hope that it would steadily improve from this on. He further stated that the Laurentide Co. was working about 90 per cent. of capacity and he believed that this was also true of the other larger companies. Very few of the companies were carrying on logging operations this year, in fact, only such men were sent into the woods as was necessary to hold together the organization, and these men were used to bring down such logs as were left over from the last season's cut, so that with the present consumption by the various companies, their "wood piles" would gradually disappear, so that at the close of this year there would be very large hole in them.

British Trade News

(From our London correspondent.)

London, February 14, 1922. — The Bury Papermaking Company, who own Gigg Mill, Bury, have declared a dividend of 10 p.c. on the preference shares. The North of Ireland Paper Mill Directors, owing to a delay in settling up accounts, caused by the Government in giving a decision on the Excess profits duty, have adjourned their annual meeting until further notice.

Sir Arthur Pearson's Will.

Sir Cyril Arthur Pearson, Bart., whose death was commented upon editorially in the "Pulp and Paper Magazine" some weeks ago, left £93,926. He was the founder of the "London Daily Express" and of "Pearson's Weekly." It was his work in connection with St. Dunstan's for the blind soldiers that was best known.

Mr. Kennedy Jones, M.P., one of the founders of the "London Daily Mail" and "Daily Mirror", and who died recently, has left £206,537.

Death of Mr. Nordberg.

Mr. J. A. Nordberg, one of the best known men in pulp circles and Father of Mr. Eric Nordberg, the Secretary of the British Wood Pulp Association, is dead. He founded and was managing-director of J. A. Nordberg, Ltd., London, and his business took him to the States, Canada, Scandinavia, and the principal places in Europe. Mr. Nordberg also sold Swedish paper and pulp, of which he was an early pioneer, and in the handling of newsprint he was an expert since the days it was produced from straw. But it is as a pulp man he was best known. He was one of the original founders of the Pulp Association and his genial and happy disposition will be sadly missed at future meetings.

World's Pulp.

"The Statist", a London paper which caters to staticians and provides some interesting information at times on the cost of living, etc., has this month figures on the exports of pulp from various countries and I give them for what they are worth in cwts. (as they are estimated):

	1918	1920
Canada	10,426,980	15,389,580
Finland	1,839,280	3,788,640
Norway	9,516,400	11,760,800
Sweden	14,192,650	19,860,930
U. S. A.	398,650	570,820

These make a total of 1,820,648½ tons in 1918 as against 2,580,350 tons in 1920. Judging by the totals 1920 excelled the past three years to 1917. The writer says: "America takes practically the total Canadian exports and this accounts for the expanding trade in woodpulp between these two countries when the submarine menace reduced to a pitiful plight the European trade in the same commodity."

Production of Paper.

An estimate of the world's paper production is arrived at by "The Statist." Here is the way it is done: "Raitt before the war gave it as 10,000,000 tons with a decennial rate of increase of 25 p.c.; accordingly, on this hypothesis, the 1920 production should be about 12,500,000 tons. We do not know of any other estimate of the world's production of paper to which we should give great adherence, but as a very low estimate was given in the Bulletin of the Rubber Growers Association at 10,000,000 tons we thought the subject worth inquiry, according to Krawany (vide "Chem Zeit" 521-530, 1910), the European paper consumption before that date was, from a per capita basis, of 4,000,000 tons; in addition, the annual rate of increase in the world's production was given in that article as 5.75 p.c., equivalent to a decennial increase of 75 p.c.; the disparity between these two results is evident. On the assumption, however, that Krawany's results hold good, the total European consumption of paper should now be 7,000,000 tons; the net consumption of the United States in 1919 was 6,500,000 tons and that of Canada 350,000 tons; consequently, if we allow a consumption of 2,000,000 tons for the rest of the world, the total production of paper from a consumption basis would be about 16,000,000 tons. On Raitt's hypothesis the corresponding figure would be 12,500,000 tons. The mean between these two results, is the probable figure, as the decennial rate of increase in production of 25 p.c. is, we consider, on the low side, being equivalent to an annual rate of increase of 2.3 p.c. The annual rate of increase in the case of the U. S. A. is 7.4 p.c.; Canada 13 p.c. and Sweden (rate of decrease) 11.5 p.c." This annual increase in the case of U. S. A. and Canada is given on the assumption that the rate of increase is uniform. The average rate, of increase between 1917 and 1919 is, therefore, given by "The Statist" as 11.4 p.c.

Countries of Production.

"The Statist" furnishes the following production statistics for various years which may be found interesting: – Netherlands, (1920), 71,704 metric tons; Denmark, (1920) 45,293 metric tons; Germany, (1913), 1,980,700 metric tons—the fall being one to the partial disintegration of the Empire; Finland, (1917), about 480,000 metric tons; Japan (1918) approximately 200,000 tons; Czecho-Slovakia, with 297 mills, had an output in 1920 from 58 miles of 226,000 metric tons; German-Austria (1920) 153,000 metric tons; United Kingdom (1907) 848,500 tons and in 1912, 1,096,000 tons (an unofficial pre-war figure). "If we assume the rate of increase", says the writer, "for Canadian production to be 13 p.c. and that for certain other countries mentioned above to be 2.5 p.c., we should get the following figures in short tons for 1920: U. S. A. 7,334,614; Canada, 1,200,000; Germany 2,600,000 on the 1913 figure; United Kingdom 1,495,000; Sweden 220,000—a total from these five countries of approximately 12,850,000 short tons. Consequently, we think that the 1920 production of paper to be at least 16,000,000 short tons. All the figures were derived from official sources, unless where otherwise stated. This assumption postulates continuous production throughout 1920, but in this country papermaking came practically to a standstill in October." The writer adds that between 80 and 90 per cent. of the world's production of paper is made from wood fibre.

The Labour Question.

The terms submitted to the workers by the Employers Federation regarding the question of working hours in the mills, are still under discussion by the Unions and they are not being received with much approval. It is to be hoped no trouble will arise, but the attitude that is being taken up by the workers' representatives is not a conciliatory one. Sir Frederick Becker says if the men would work 48 hours a week instead of only 44 hours they would greatly help the mills. The Unions think, on the other hand, that it is not the time to broach such a subject with so much unemployment and short time.

Two steamers, bound from the Baltic to New York and Baltimore, have had to put into ports on the Scottish coast and discharge their cargos of pulp owing to damage sustained. In one case the pulp was for the National City Bank, N. Y. and the American Wood Pulp Corporation.

PULP AND PAPER NEWS

Mr. A. E. Cadman, who has been with the Canadian Export Paper Co. for several years, has been appointed assistant to the secretary of the Canadian Pulp and PaPer Association. Mr. Cadman's specialty is the compiling statistics, of of which there is a great deal required in the work of the association.

Mr. F. W. Pennock, who has been vice-president and general manager of Cleaton Co. (of Canada) Ltd., has resigned that position and is now solely connected with the firm of Gelinas and Pennock, Regd., Engineers, 207 St. James St., Montreal.

Peculiar circumstances surround the death of Cyril Dawe, who was found dead on the floor of the Beater Room at the Beaverboard Plant. Definite information is hard to secure, but as far as could be learned next morning Dawe was missed by his fellow employees. The men looked around the plant and found him lying on the floor.

On Wednesday evening he had suffered a fall and it is thought this may have been more serious than was first anticipated and may have been the cause of his death. There was a report around that death had been caused by coming in contact with an electric wire, but this is now thought to have been impossible.

Deceased, who was 39 years of age, was employed as a beaterman and well thought of by his fellow employees. Besides his wife he is survived by three small children.

Abitibi has **some** hocky team. They beat the crack delegation from the Soo at the Iroquois Falls rink in a brilliant exhibition before 2000 fans by the score 4 to 3, and came off with a tie score from the next contest at the Soo. This qualifies them as contestants for the Allan Cup. The Iroquois Falls junior team is also in the finals of the N. O. H. A.

Pulp and paper people are going in for dramatics. The La Tuque Amateur Dramatic Society successfully presented a three act comedy entitled "His Last Chance" at the Community Club. At Shawinigan Falls, the Technical School hall was crowded to witness a Hindu musical romance, "Idol Worship".

The Howard Smith Paper Mills, Limited, are arranging a series of social gatherings with a view to promote co-operation between the head office in Montreal and the various divisions. Two gatherings have already been held, one in Beauharnois and the other in Montreal. The program included hockey matches, dinners, and dances. At Beauharnois the hockey match was won by the Montreal offices. The Montreal luncheon was held on February 18th. The hockey game, played on the McGill campus, resulted in a tie. Two all Adjournment was then made to the Fairmount Hall, where the dinner and dance took place. Mr. E. Howard Smith, jr., presided at the dinner, and in a brief speech, referred to the friendly spirit of co-operation fostered by such events. They enabled the head office and the various divisions to get together more closely. Thereby securing a better understanding and a smoother running of their business. About 80 were present at the Montreal gathering.

Mr. F. W. Brawn has resigned his position as Plant Manager of the Sulphite Mill of the Fraser Companies at Edmonton, N. B. Mr. Brawn is enjoying a few weeks holiday at Portland, Maine, before entering the employ of another large mill making bleached sulphite. Mr. Armstrong has transferred his affections from the Lincoln Paper Mills to succeed Mr. Brawn.

Mr. Camille Laurendeau, B.Sc.A., graduate of Laval University, son of Judge Laurendeau of Montreal, has joined the sales force of the MacKinnon Steel Co. Limited, with office at 404 New Birks Bldg., Montreal.

Mr. Norman E. Wainwright has left for London, England, to open an export office for the Provincial Paper Mills, Limited, and the Howard Smith Paper Mills, Limited. It is hoped in this way to extend the foreign business of both companies.

Sir Frederick Becker, of London, England, whose world-wide activities in pulp and paper are so well known, is on a business visit to the United States and Canada.

Mr. Frank O. White, chief engineer of the Brompton Pulp and Paper Company, has left that company and returned to Orono, Maine.

PULPWOOD NOTES FROM PORT ARTHUR.

By order of the Court, Sheriff A. W. Thompson, offered for sale, 4,982 cords of pulpwood, formerly the property of the Kaministiqua Pulp and Paper Company. The wood was sold by the Sheriff under the Woodmen's Lien for Wages Act, at the suit of the E. J. Bawlf Cartage Company, of Winnipeg, Man.

The first bidder was the Consolidated Water Power and Paper Company, of Wisconsin Rapids, Wis., purchasers of the property and plant of the Kaministiqua Pulp and Paper Company. The bid was $32,000. This was followed by quite spirited bidding, until $40,000 was reached, when the property was knocked down to Thomas Fans, Timber Contractor, of Port Arthur, for that sum.

It is understood that the Department of Lands and Forests, has consented to issue a license for the export of this wood, if the purchaser so desires.

The wood is stored on the lands of the Consolidated Water Power and Paper Company, at Port Arthur. It is understood to be the intention of the purchaser to ship the wood to the United States.

Mr. Boyd, of the Nyando Pulp and Paper Company, left today for an inspection of the company's camps, in Quetico Park, where they are taking out a large cut of pulpwood for export.

U. S. HOLD UP CANADIAN PULP SHIPMENTS.

Canadian pulp companies are concerned and surprised by a notification from the United States Government that shipments of Canadian Pulp will be held up at border points pending an inquiry as to whether the pulp is being shipped in violation of the anti-dumping Act.

This action, which is of course, only of a temporary character, has caused considerable inconvenience and has also interrupted our pulp trade with U. S. customers.

It must have been good to live in the old days when you could kiss a girl and not taste anything but girl. Nowadays one is apt to get the painter's colic.

Technical Section

REVIEW OF RECENT LITERATURE.

A-15. Constitution of Hydrocellulose. H. Ost and R. Bretschneider. **Z. angew. Chem.**, xxxiv, 422-423, (1921); J. Soc. Chem. Ind., xl. 654A, (Sept. 30, 1921). Results indicating the hydrocelluloses are simple substances and not mixtures of cellulose and cellulose dextrins have been obtained by a comparative examination of hydrocellulose and cellulose before and after treatment with boiling lime-water. The hydrocellulose made by Girard's method and the cellulose, purified as for nitration purposes, had "copper numbers" 6.69 and 2.05, "cellulose numbers" 0.14 and 0.30, and contained 0.24-0.34 per cent and 0.30 per cent. of ash and 3.17-3.94 per cent. and 5.39 percent. moisture respectively. After digestion for 12 hrs. in boiling lime-water (0.5-1.0 per cent CaO) 24.4 per cent. of the hydrocellulose and 15.8 per cent. of the cellulose had dissolved, and the "copper" and "cellulose" numbers of the final undissolved residues were 0.91 and 0.61, 0.29 and 0.36 respectively. The final residue from the hydrocellulose was similar to the untreated hydrocellulose, and was not cellulose, since the viscosity of its solution in cuprammonium solution (after 24 hrs. at 19 deg. C.) was equal to the viscosity of a similar slution of the original hydrocellulose, but approximately only one-half of that of a similar solution of the purifieed cellulose. Moreover, the portion of hydrocellulose which remained after digestion for 13 hrs. with lime-water gave, on acetylation under various conditions, a cellulose acetate having a solubility in acetone similar to that of the acetate of the original hydrocellulose, but much greater than that of the corresponding acetate from the purified cellulose.—A. P.-C.

B-4. Production of Artificially Dense Charcoal from Hydrolyzed Sawdust Residues. L.F. Hawley, Section of Derived Products, Forest Products Lab., Madison, Wis. **J. Ind. Eng. Chem.**, xiii, 301-301 (April 1921). The insoluble residue obtained by hydrolyzing sawdust with dilute acid and leaching out the sugars was briquetted under a pressure of 35,000 lbs. per sq. in., giving a product having a specific gravity when first made of about 1.21, which in a few hrs. swelled out to about 1.18, after which there was little more swelling. When distilled under a pressure of 300 lbs. per sq. in. (estimated) at a final maximum temperature of 450°C, the briquets gave a yield of 40% of charcoal with an apparent density of 0.52 and an absorption value for chlorpicrin (See **J. Ind. Eng. Chem.**, 519, 1919.) of 700. On a larger scale (commercial-sized unit) an apparent density of 0.63 and a chlorpicrin value of 600 were the best that could be obtained after incomplete experimental work.—A.P.-C.

C-7. Drum Barker. Can. patent No. 194,245, The American Barking Drum Co., assignee of Herbert Guettler, both of Chicago, Ill., U. S. A., Nov. 25, 1919. The drum is built up of U-bars having the rounded portions directed inwardly toward the center of the drum annd spaced apart an appreciable distance from one another, so as to form pockets adapted to catch the corners of the wood blocks and positively force them to travel around with the drum. Claims allowed 10.—A.P.-C.

F-2. Removal of Offensive Odors in the Sulphate Pulp Mill. Carl G. Schwalbe. **Zellstoff u. Papier**, i, 69, (June 1921). Translated by Clarence J. West in **Paper**, xxviii, 13-15, (Aug. 17, 1921). According to Klason mercaptans, methyl disulphide and methyl suphide are formed in the sulphate process. The amounts of these products per ton of pulp are stated. Klason found 1.3 mg. of methyl sulphide in 1 cu. m. of flue gas. When caustic is used instead of sodium sulphide the yields are lower and the fiber is inferior, and the liquor has an odor which is attributed to the sulphur compounds of the wood. High chimneys have been installed with a view to discharging the gases into the higher strata of air and thus render the waste gases innocuous. Sunlight exerts an oxidizing action on these compounds, and the effect is noticeable on a cloudy day. The condensation of the water in the gases yields an ill-smelling liquid which is a nuisance and the removal of which requires such oxidizing agents as permanganate, peroxides and bleach, and the treatment is expensive. The patents of Muller, Nielsen, Schacht, Schwalbe, Waldhof are mentioned, and especially Ger. patent No. 319,594. Schwalbe in this patent allows the gases to pass through wood chips simultaneously with chlorine. The wood is eventually used for pulping as the fiber is not harmed by chlorine.—H.E.W.

F-5. Preparing an Impure and a Purified Cellulose. Fr. Pat. 509,599, Lachmann-Mosse, Feb. 10, 1920. **Industrie Chimique**, viii, 415, (Oct. 1921). The raw materials are cooked under pressure in a liquor containing weak alkalis, such as sodium carbonate, sodium sulphate, or alkaline sulphides. For example, wood may be cooked at 150°C with a solution containing 80 kilos of sodium sulphate and 8 kilos of sodium sulphide dissolved in 500 liters of water, per 100 kilos of wood. The cooked material is easily separated into its fibers and consists of a pale yellow pulp, which gives a slight red coloration with phloroglucine. 100 kilos of jute treated at 135°C for 4 hrs., with a liquor containing 15 kilos. of soap, 10 kilos of sodium carbonate and 5 kilos of sodium sulphide gave a pulp which could be bleached perfectly with 20 p. C. of bleaching powder. —A. P. C.

F-0. Process for the Preparation of Soda Pulp. Fr. patent No. 510,142, Hottinger. **L'Industrie Chimique**, viii, 415, (Oct. 1921). The present process effects a reduction in the consumption of heat, time, and liquor, and allows of bleaching with chlorine gas, without transforming it into hypochlorite. The caustic soda is used directly as it comes from the cells, at a strength of 18-20 peer cent. The material is placed in an autoclave and subjected to a vacuum to eliminate the air in the tracheids of the material and facilitate the penetration of the fresh liquor. The chlorine gas is led directly to the washer.—A. P,-.C, ,

UNITED STATES NOTES

The paper stock plant of Oscar Gumbinsky & Bros. at Kalamazoo has been purchased by a group of Michigan capitalists who intend forming a new corporation to operate it. This corporation will be under the control mainly of the Bryant Paper Company which will use the Gumbinsky plant as a source of supply of waste paper for its immense mills. The new company will not limit its sales, however, to the Bryant Company. It is planned to have it conduct a regular paper stock business, going regularly into the open market for outside trade. The purchase price for the property is said to have been about $100,000. The sale means the passing of Oscar Gumbinsky and Bros. as active factors in the Kalamazoo paper industry. The same concern will continue its large plant in Chicago and warehouses owned and controlled in other cities, also devoting more of its time to woollen cloth manufacture, a line taken up about two years ago.

Despite declarations by customs officials stating that no evidence has been found abroad to sustain charges of pulp and paper dumping into the United States, Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, is again directing official attention to new offers of foreign material, contained in letters from importers or agents of foreign mills. This means a renewal of the Associations dumping fight, and is in addition to the part it has played in the effort to secure the speedy enactment of a protective tariff.

A recent addition to the sales staff of the Allied Paper Mills of Kalamazoo, Mich. is D. C. Culbertson, who will direct sales in the Eastern territory, with headquarters at 200 Fifth Avenue, New York. The product to be handled by Mr. Culbertson includes papers made by the King Paper Company, the Monarch Paper Company and the Bardeen Paper Company.

Dexter Sulphite Pulp and Paper Company, were filed

The American Railway Express Company reports a

The transcript of examinations in a suit for $3,500,000 by William R. Hearst, newspaper publisher, against the score of 99.10 on the part of the shippers of the United States made during its recent "perfect package campaign." Reports of the business handled and the number of exceptions taken on packages, because of some error or defect in packing, marking or registration, were tabulated in Chicago by a corps of accountants, and took a week to complete. Of 9,339,745 freight shipments handled by the railroads during "perfect package month", exceptions were filed by the carriers in 101,760 instances. During the same period the express company handled 10,899,352 shipments, to which 81,070 exceptions were taken.

March 15 to stock of record on March 4.

The Union Bag and Paper Corporation has declared a dividend of $1.50 a share on the capital stock for the current quarter, in contrast to previous dividends at the rate of $2 quarterly. The payment will be made on as part of the record in the action in the Supreme Court, New York last Thursday. The suit was brought by Mr. Hearst on the ground that a commission on the sale was accepted by Carl F. Zittel, who was his representative in negotiations for the purchase. The examinations were of Paul Smith and Frederick L. Moore, and they relate to an agreement which the latter say they reached with Zittel and Senator James A. Emerson, who has since died. Smith and Moore declare that they and Emerson were to receive a commission of $500,000 on the sale and that at a meeting at Schroon Lake in the Adirondacks, Zittel told them Mr. Hearst was in the market for $20,000,000 worth of pulp and paper property and that an agreement was made whereby Zittel was to get $125,000 as his share of their commission.

C. C. Davis of the Eaton, Crane and Pike Company, addressing delegates to the convention of the Wholesale Stationers' Association of America in the Hotel McAlpin, New York last Friday, gave the details of an intensive advertising campaign being launched by an organization of about twenty leading manufacturers of writig paper, to feature the gift idea in writing papers, with a slogan of "The Write Gift". The idea, Mr. Davis said, is to popularize the giving of writing paper so that such gifts will become as common as those of candy, flowers, etc. The industry generally, he pointed out, will be materially benefited. He told the jobbers that 30,000,000 advertisements will appear during the fall of 1922 in leading magazines, etc., while booklet, billboard and other advertising will aid in publicity.

MORE FUNDS AND A WIDER WORK.

The Canadian Forestry Association, which instituted and carried through for many years past, extensive educational campaigns in Quebec province, to secure popular co-operation in the protection of forests from fire, has applied to the Government of Quebec for a grant this year of $5,000. The former grant to the Association was $500.

Nearly all fire protection experts throughout Quebec are well agreed that while rangers, canoes, lookout towers and other mechanical equipment with first class personnel, are absolutely essential in any forest protection scheme, all such measures will be ineffective unless *public opinion* is won for the forest protection cause. The interest of every citizen of Quebec is bound up with protection of the forests and it seems an anomaly (which propaganda could easily and quickly overcome) that such citizens should persist in destroying the source of their daily income. It has been proved in many countries and in many districts of Canada that forests burn chiefly because of a wrong attitude on the part of the general public. Eight out of ten of last year's forest fires were set by human agencies. Is any one to suppose that while such causes as good roads, workmen's compensation, etc. can be put into action by securing the verdict of a well informed public, forest protection is something quite different on which the average citizens cannot come to an intelligent conviction?

The Canadian Forestry Association, being independent of governments and commercial interests, is excellently equipped to carry on forest protection propaganda. It has used all of its methods to the maximum extent in Quebec province, reaching into scores of districts at a cost of thonsands of dollars for field lecturers, motion pictures, the operation of its lecture cars and forest exhibits car and the general maintenance of its educational propaganda. To give a substantial grant to such an Association would seem to be only a common-sense method of applying first class insurance to the timber resources of Canada.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, February 28.—The paper market continues to improve. In practically all sections the demand is better, and in some the buying shows a decided expansion. There is a more confident feeling — a belief that we are down to about normal. It looks as if we are on a stabilized basis so far as prices are concerned, and as if purchasing can be done without fear of appreciable changes. In general, orders are not of large volume, but jobbers are now buying more freely to replenish depleted stocks. The orders for fine papers are coming in better, while more for book papers are satisfactory. Other departments report a fair amount of trade. Newsprint maintains its firmer tendency.

The pulp industry is still dull, although there are signs of a revival in the demand. It has been slower in coming than was hoped for. Pulpwood is inquired for more freely , but the market is slow.

It is evident from the financial statements and dividend announcements that the pulp and paper companies are adopting a very cautious policy. They are, in fact, conserving their financial resources, the directors passing or reducing dividends rather than impair the financial position. No doubt many shareholders are disappointed in receiving smaller returns, and in some cases no return, but in view of conditions, there can be no question that a conservative policy is the correct one.

The exports of Canadian paper, particularly outside the U. S., are on a reduced basis. In Australia and New Zealand, competition is exceptionally keen — in some instances goods are being sold below cost. Canada is handicapped in Australia because our manufacturers have no reference, although there are hopes that they will secure one in the event of the negociations between out Government and that of Austria materialising into a tariff treaty. In view of these negotiations the action of the deputation of the Canadian Pulp and Paper Association which interviewed our Government came at a very opportune time. If Canada can secure a preference, our manufacturers will at least be in a position to maintains the trade connections obtained at considerable cost.

The shadows and bright spots seem fairly well divided in the Toronto district. The situation for the most part appears encouraging, with a good basis for optimism as to the future. Some surprise and gratification is noted with regard to the book paper situation in Canada. Business in this line is distinctly better than across the line, and the fact that the mills are fairly well occupied with orders indicates that the industry has the general support of Canadian consumers. More printing could be done and should be done, with better business for the mills. The campaign of the Master Printers will no doubt convince many business men of the advantage and economy of using good printing effectively.

No one has so much business he could not do more, but everyone ir fairly busy and prices are quite firm Nothing but lower costs can bring prices down, and mill men are not inclined to force a wage scale that will not give their employees a decent living. No Canadian should expect a price that represents the industrial slavery of some other countries — we are Anglo-Saxons.

PULP EXPORTS GAIN OVER LAST YEAR.

Canadian pulp and paper exports for January, 1922, were valued at $8,831,480 compared with $9,663,054 in January, 1920 and with $10,325,533 in the preceding month of December, a decline of $831,574 from last year gained 207,193 cwts in volume but lost $1,565,682 in value this year compared with last, while pulp exports gained 805,025 cwts. in volume and $1,280,119 in value.

Exports of pulpwood for the month amounted to 66,094 cords, valued at $696,943, compared with 155,752 cords, valued at $2,271,363, last year.

Comparative detils for the month show:

Paper	January, 1922 Volume Cwts.	Value
Newsprint	1,354,024	$4,966,352
Book paper.	118	784
Other paper	. . . . . .	410,329
Total paper		$5,377,465
PULP		
Sulphate (kraft). . . .	196,144	609,943
Sulphite, bleached. . . .	249,406	1,072,091
Sulphite, unbleached. .	222,399	631,910
Mechanically prepared	572,173	1,140,071
Total pulp	1,240,122	$3,454,015
	January, 1921 Cwts.	
PAPER—		
Newsprint	1,146,831	$6,532,034
Book paper.	7,073	109,205
Other paper	. . . . . .	847,919
Total paper		$7,489,158
PULP—		
Sulphate (kraft	83,722	426,827
Sulphite, bleached. . . .	74,125	526,839
Sulphite, unbleached. .	143,299	824,094
Mechanically prepared	133,951	396,136
Total pulp	435,097	$2,173,896

Countries of destination were: Paper — United Kingdom, $122,038; United States, $4,852,943; other countries, $402,484. Pulp — United Kingdom, $578,550; United States $2,810,373; other countries, $65,092.

Comparative figures for the first ten months of the current fiscal year show:

	Paper	Pulp	Total
1922	$56,473,800	$30,262,955	$86,736,755
1921	75,177,855	67,401,198	142,578,053
1920	49,717,824	33,858,354	83,576,178

Exports of pulpwood to the United States for the ten months' period compare as follows: 1922 — 630,510 cords, valued at $7,926,536; 1921 — 1,243,112 cords, valued at $16,396,940; 1920 — 738,477 cords, valued at $7,417,390.

TRADE-MARK
REGISTERED

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft Pulp mill in Finland except one, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

—ALSO—

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SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Wood Pulp Union, Helsingfors, Finland

a combination of the foremost Ground Wood Pulp and Board Mills in Finland, makers of various kinds of boards and dry and wet Brown and White Mechanical Wood Pulp.

Get the most for your money by getting next to our qualities and prices!

WOOD PULP

TRADE MARK

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Telephone: Murray Hill 4246-47

CHICAGO OFFICE:
1932 Conway Building.
Telephone: Main 1770-71.

INQUIRIES SOLICITED:

NEW YORK MARKETS.

New York, February 25 (Special Correspondence) —Improvement in the paper situation continues to be slow. There seems little question that improvement is taking place to a more or less degree, but consumers are expanding their buying in extremely cautious fashion, not because they haven't faith in the stability of paper prices but because of the uncertainty existing in their own trades and the conceded necessity of proceeding carefully in laying in stocks of materials. It is becoming more and more evident every day that the basic cause of the present limited demand for paper does not lie in the paper industry itself, but in the consuming trades. Paper prices are fairly well readjusted on levels close enough to pre-war normal to be creative of confidence in the average buyer, while high-priced stocks of paper of various kinds have been well liquidated, thus placing the industry in a comparatively healthy position. Buyers are holding off, not because they fear any further important decline in paper costs but because they are not urgently in need of supplies and because they deem it wise business judgment under ruling circumtances to confine their purchases to amounts actually and immediately required. It begins to look therefore as if demand for paper will not broaden to normal proportions until matters in the consuming trades are improved sufficiently to induce paper users to increase their buying.

No changes of note have developed during the week in newsprint. Demand for print paper is good—probably proportionately better than for any other single kind of paper, and mills are securing enough business to keep them running at a fair rate of capacity. Prices are holding, and while considerable newsprint continues to arrive into the United States from European sources, indications are that less competition is being felt from this quarter, most of the supply now reaching this country from abroad being against back orders with manufacturers on the other side of the Atlantic paying less attention to the American market than in some months.

On the other hand, it is stated on good authority that quite some competition is being felt in the wrapping paper market by shipments of kraft wrapping from Sweden. It is an accepted fact in this country that Swedish manufacturers make equally as fine wrapping paper as do our domestic producers probably a little bit better in some cases, and the Swedes are now shipping considerable tonnage of wrapping paper into this market at prices substantially under domestic quotations. The result is that domestic kraft wrapping paper producers frequently are finding it necessary to cut a good deal under their quotation of 7.50 cents per pound on No. 1 domestic kraft to obtain orders, and the actual market level on kraft wrapping is said to be nearer 7 cents than the higher figure.

Book papers are in a quiet position insofar as regards big business. Orders for small quantities approximating single carloads are being placed with mills with fair regularity but there is not near enough business go around and manufacturers are exerting every possible effort to get their share and more of such business as is to be had. Machine finished book paper is quoted in New York at 5.75 to 6 cents a pound delivered, and there have been reports of sales at even less than 5.75 cents. Tissues are wanted only in limited-sized amounts though quotations are holding moderately steady at around a basis of 90 cents per ream on No.1 white tissue.

Trade in box boards is on the rise, and prices on board are hardening under the increased movement of supplies into consuming channels. It is understood that box manufacturers here are looking for a lively spring trade this year and that they are laying in board to be in readiness for the expected orders for boxes. Board quotations rule steady at $37.50 to $40 per ton f.o.b. New York on chip, and from $40 to $42.50 on news board.

An annual statistical review of the paper industry of the United States issued by the Federal Trade Commision shows that production of paper last year declined to the lowest point of the last five years. A total of 5,356,317 net tons of all grades of paper and paper board was produced by domestic mills in 1921, compared with 7,334,614 tons in 1920, 6,190,361 tons in 1919, 6,051,523 tons in 1918, and 5,919,647 tons in 1917. Mill stocks of all kinds of paper at the close of 1921 amounted to 253,644 net tons, contrasted with 214,396 tons at the beginning of that year.

GROUND WOOD—There has been little new trading activity in mechanical wood pulp. Consumers are limiting their buying to tonnage directly needed and the aggregate movement of supplies is said to be considerable under normal. If anything, prices are on a slightly easier level. No important change has occurred but there is quite a weakening tendency noted, and buyers doubtless are frequently succeeding in getting some lots at concessions. About $31 to $32 a ton at grinding plants is the basis commonly quoted by domestic producers in Upper New York State and New England, purchases are reported from Canadian manufacturers down to $27 a ton f.o.b. grinding mills.

CHEMICAL PULP—Current business in chemical

Scandinavian American Trading Co.

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A standardized unit easily installed. No squeeze roll required. Entirely Automatic. Cleans continuously while the paper runs. Requires no attention from machine men. Gives a cleaner and more consistent sheet.

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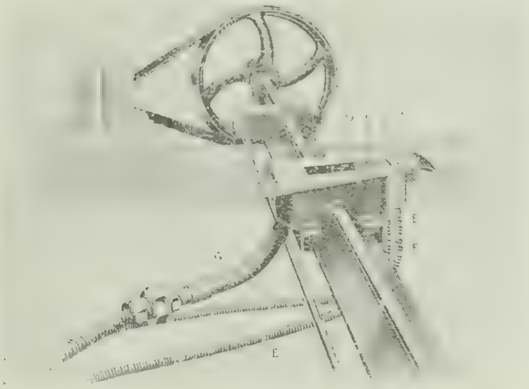

INCREASES PRODUCTION. REDUCES WORKING COSTS.

wood pulp is scattered and chiefly of a hand-to-mouth character: that is, consumers are coming into view as buyers only when in urgent need of supplies and even then are purchasing merely enough pulp to last them for a short period. Stocks, however, are fairly well held and quotations are more or less maintained though some offering of kraft pulp at easier figures is reported. Sulphite is moving in comparatively good volume and at last reported prices. Kraft is selling at around 2.65 to 2.75 cents a pound at domestic pulp mills, or ex dock for Scandinavian kraft. Prices on domestic bleached sulphite are maintained at 5 to 5.25 cents a pound at pulp mills for the No. 1 grade, while No. 1 foreign bleached sulphite is quoted at 4.25 to 4.50 cents ex dock New York or other American Atlantic ports.

RAGS—Trade activity in roofing rags continues of fair dimensions and prices on this class of papermaking rags hold steady, wheras other grades are moving in small amounts and at rather a wide range of prices. New York dealers report sales of No. 1 roofing stock at 1.15 to 1.20 cents per pound f.o.b. this city, and of No. 2 packing at 1.00 to 1.10 cents, while in the Middle West slightly higher prices are reported received. Old whites are selling here and there in limited-sized lots at around 5.50 cents a pound for No. 1 repacked whites, 2 cents for house soiled and 1.50 cents for street soiled. Old thirds and blues are little wanted by paper mills and dealers freely offer repacked thirds at 2 cents a pound and rough packing at 1.40 cents without getting much response. New cuttings are tapering off in demand and display an easing price tendency.

PAPER STOCK — Prices on waste paper rule moderately firm and there is a comparatively good movement of supplies into mill channels though dealers readily admit consumers are not absorbing anywhere near the tonnage that they ordinarily do. However, there appears to be ample demand to remove the great bulk of available stock, and with supplies coming forward from collection sources in lighter amounts than usually, sellers are insisting on full quoted prices. White shavings are quoted in the New York trade at 3.90 to 4 cents per pound f.o.b. this city on No.1 hard, and around an average of 3.40 cents on No. 1 soft shavings. Old flat books and magazines are selling at 1.40 to 1.45 cents a pound New York, old kraft paper of No. 1 grade at 1.90 cents, white blanks news cuttings at 1.80 cents, ledger stock at 1.75 cents, folded newspapers at 60 cents a hundred pounds, and No. 1 mixed paper at 47½ to 50 cents.

OLD ROPE AND BAGGING A little better demand is reported for old bagging and sales are noted at 90 cents to $1 a hundred pounds for No. 1 scrap burlap, and 75 to 80 cents for roofing bagging. Old rope is stationary in price at about 4.50 cents a pound for No. 1 manila rope. Mixed strings are meeting with a fair demand and are bringing an average of 90 cents a hundred pounds f..o.b. New York.

It was learned from Quebec this week that a note of $127,000, due by the Riordon Company in favor of the Provincial Government, had been extended Monday for a further period of three months. This amount, it will be remembered, is well secured by water power development works and other property.

East Angus has a new theatre and a new fire alarm system. Any connection?

CHEAP LUBRICATING OIL.

(Copyrighted, 1922, by W. F. Schaphorst.)

It always pays to use a good grade rather than a poor grade of lubricating oil.

Never buy oil simply because it is cheap, because it may prove, in the end, to be expensive.

In many instances it has been found that by abandoning the use of a cheap lubricant and substituting a higher grade, although slightly more costly lubricant, the friction load has been reduced 20 per cent. or even more, which may be a considerable item in many plants.

The first question, however, that the owner or official may ask is: "What is my friction load and what will be the dollars and cents saving per year if I can reduce my friction load as much as 20 or 25 per cent by using a higher grade oil?"

To determine the friction load, possibly the best method is to use a steam engine indicator if the plant is driven by a steam engine, or if it is motor driven, it is a simple matter to determine the friction load by simply taking the readings on the switchboard with all machines running, but running "empty". That is, the friction load is the power required to drive all machines in the plant while they are "unloaded" and are not doing any useful work. If the steam engine indicator shows that the friction load is 10 horse-power, it means of course that 10 horse-power is required to drive all machines empty and it means that this much power is being used for overcoming the friction load all day long even when the machines are loaded. The useful work is simply an additional load added to the friction load, the friction load being practically constant all the time. The same is true for motor driven machines as well as for steam engine driven machines.

If, for example, it is found that the friction load in your plant is 10 horse-power, and the cost of power is only 2c per horse-power per hour, the cost of the friction horse-power alone would mean 20c per hour, or$2. per 10 hour day. Assuming 300 working days per year, the cost of the friction horse-power per year would be $600.00. Then, if it is possible to reduce the friction load by 20 per cent by using a better lubricant the saving per year would be 20 per cent. x $600 = $120, in power alone. In addition to this, the reduction in friction load means that there would be less wear in the bearings, the belts would be capable of pulling a greater load because they would not be stressed so much, and altogether the saving would amount to more than $120 per year. For that amount of money a great deal of lubricant can be purchased and it surely becomes perfectly evident that it pays and pays well to spend "just a little more" money, if need be, for a higher grade of lubricant.

Of course, it is foolish to pay a high price for oil for the mere sake of paying a high price. If indicator or switchboard tests show that the more costly lubricant does not reduce the friction load, it is good economy to go back to the former and less expensive oil. In fact, this writer knows of instances where less costly oil has actually given better results than a higher priced oil in the matter of friction load, thus creating a triple saving — —the saving in cost of oil, the saving in cost of power, and the saving in cost of wear and tear.

Nine times out of ten, where much lubricant is used and where economy is desirable, this matter is worthy of careful investigation.

That is the time that tries man's soul—when the tide is against him.

Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE P. Q., March 9, 1922. No. 10.

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Gulf, Matagorda County, Texas.

:-: EDITORIAL :-:

MADE IN CANADA.

Two very disappointing incidents have come to the attention of the editor this week. The first is merely an envelope. It is a long business envelope bearing the name of a company manufacturing a product involving the use of groundwood pulp, the monogram of the company and under this the words "Made in Canada". On turning the envelope over we notice on the back the words, "Made in U. S. A.", which evidently were printed at the same time as the inscription on the front. As stated above, we are very much disappointed, to say the least. Here is a company depending upon the Canadian forests, Canadian water power, Canadian labor and enjoying a Canadian market and apparently for the purpose of encouraging domestic consumption on their product, advertise that it is made in Canada, yet this company goes to the United States to buy its envelopes and its printing. Within a few miles of the company's mill the same grade of paper, as well as both better and cheaper grades as compared with that used in the envelope, is manufactured. There are printing establishments, probably within sight of the mill, that would do just as good a job of printing on an envelope made in a Canadian plant. There are perhaps some occasions when there is reason for a concern to go outside of Canada for certain special paper requirements but why anybody can advertise "made in Canada" on an imported envelope and even with the printing done in another country is quite beyond our comprehension.

The other incident, which somewhat disturbs our equanimity, is the fact that in an extensive exhibit of Canadian products in Montreal this week, we fail to find but two purely Canadian pulp or paper manufacturer represented. There are textiles, soap, perfumery, candies, garments, hardware, hats, shoes and many other articles and materials but we do not find Canadian made bristol boards, wrapping papers, book papers, tissue papers, blotting paper, newsprint paper, roofing paper, grease-proof paper, wax paper, carbon paper, adhesive paper, and so forth, shown in the booths. The exhibit is largely left overs from the holiday trade, and while a good assortment is shown, the effect would be better if the greeting cards were removed.

We do not know whose fault it is but it is certainly disappointing at a time when Canadian paper mills are turning out such a variety of excellent product, at a time when large amounts of paper are unnecessarily imported from other countries and at a time when considerable effort is being made to expand and extend the use of paper and paper products, not to find a representative exhibit of Canadian paper-making in such an extensive show as is now taking place in Montreal.

A CONTEST IN DOING GOOD.

On another page in this issue is a notice regarding the awarding of prizes in the Safety First competition of the Ontario Pulp and Paper Makers' Safety Association. The handsome shield which will be in possession of the winner in each class for the coming year and the banners which will be their permanent possessions, are reminders of an effort well spent in a keen competition. The shield and the banner are merely symbols of the far more valuable good that has come as a result of the fine cooperation of every individual and each department in these mills. The records are excellent and the management and the men are to be most highly commended for their success. Our congratulations, however, are heartily extended not only to the winners of the prizes but to the others who strove faithfully to reduce accidents and accident hazards in other plants but who accidently failed to make the mark. The good work of the contest is therefore, not limited to the award to the winner but is spread over the whole pulp and paper industry in Ontario where every mill has improved its record through its endeavor to win the prize. The experience of the past year has apparently awakened all the Ontario mills to the value of the contest and inspired them with a determination to have that shield during 1923. Our own experience in the matter of permanent trophies is that year after year the contest grows keener to have one's name on the shield or the cup. We recall many a class contest where the event of the year which most closely knit the class members together was the determination to get the class numerals on a certain trophy. We feel sure that this safety contest will likewise result in an "esprit de corps" in each mill that will make the organization a unit not only in accident prevention but in all other good work.

Our hearty congratulations to the winners and to the executive of the association for their success in the 1921 contest.

The capital invested in Canada's 100 paper and pulp mills was $347,553,333 in 1920. Several mills have been built since then and many improvements made.

TO FIRE PUBLIC OPINION.

There are two commonly accepted meanings to "fire" when used as a verb. The first is to kindle, arouse, enthuse, inspire and the like and the other is to discharge, to remove, or to do away with. There are people who fall into two distinct classes with regard to public opinion. There are those who would neglect and ignore this great force as well as those who would encourage and make use of it. Persons vitally interested in any movement for the good of a community or country, rightly reckon public opinion as unquestionably the greatest force which they can enlist. Public opinion is guided either by indifference to, or knowledge of facts. This is a matter of education. Occasionally the public is mis-educated or at least, informed wrongly as to facts, either by intentional misrepresentation or by incomplete exposition. Probably in most cases, however, a negative public opinion is due either to indifference or lack of any information. It is largely because of the failure heretofore, to enlighten the public as to the facts and to arouse this mighty force from a state of coma that public opinion has not been inspired to an attitude towards our forest resources which over a period of a few years might have prevented most of the enormous destruction that our generation has seen.

Undoubtedly the most active agency in Canada in this matter of arousing public opinion to a definite and useful stand in the matter of forest management and forest protection, is the Canadian Forestry Association. This organization has for its sole object, the perpetuation of Canada's forest wealth, an enormous mass of capital which will perpetually pay regular and increasing dividends to the Canadian people if properly protected. The Association includes thousands of members who are lovers of the forest; this number naturally includes many who derive their livelihood from the cutting and manufacturing of timber into useful products. These people realize that the passing of the forest means the losing of jobs. They realize that the great majority of Canada's timbered areas are unfit for agriculture and that as these areas become devastated through the carelessness of men and the ravages of nature, there is just that much less opportunity for work and development for the Canadian population. Those who work in the woods realize that human carelessness is by far the most destructive agency in the world, and it is the realization of this fact which has moved the association to direct its efforts chiefly to the education of the public towards the vast inheritance with which nature has endowed them and to educate them to the necessity and means for maintaining the forest in a productive condition.

The effectiveness of the Forestry Association as an organization, depends to some extent on the fact that it is a popular body and the membership fee is purposely kept at a small figure in order to bring in the largest possible number of members so that the ideals of the association and the inspirational literature sent out through bulletins and the Canadian Forestry Magazine may reach a large and widely distributed membership. In this way the doctrine of forest conservation reaches the maximum number. If no one but members of the association entered our forests there would be little to fear from the destruction due to carelessness because these members love the forest, realize its value and are careful with fire. Unfortunately this is not the case and in order to reach the ninety and nine who are outside of the fold, an extensive educational campaign through every possible means must be constantly carried on. The membership fee does not begin to pay the expenses necessary for carrying on this essential work.

The protection of the forest is too big a job and too great a responsibility to be entirely borne by a purely voluntary organization. There is no organization in Canada working more constantly nor more effectively in the interests of public good than is the Canadian Forestry Association. The forest is really the backbone of prosperous Canadian industry and it is a national duty to assist in every way for doing this work. Heretofore, the Federal Government has appropriated $500 for the work of the Association. For a guess we should say this would pretty nearly pay the postage expenses. A request is now made for a grant of $5,000. The difference of $4,500 expended under the careful management and control of the association, could very easily bring a return of a hundred fold in the saving of the forests of Canada. These forests belong to the people and the people's money should be devoted to their protection. When the people of Canada realize they are paying money to protect the forests and educated to the point where they realize that the destruction of the forest means lack of work and increased taxation personally, we shall have fewer forest fires and we shall have better forest management.

By all means let Parliament appropriate this mere $5,000 to so good a work.

VALUE OF JACK PINE.

Jack pine, once counted of little worth, says a Forestry Branch bulletin, is now recognized as a useful wood. It is used in immense quantities for railway ties, being, in fact, the leading tie timber of Eastern Canada. It is also being used in increasing quantities for lumber. Jack pine is frequently attacked by a fungal disease, which, in the earlier stages of its development, causes a reddish discoloration often referred to as "red stain." In later stages the fungus breaks down the fibre of the wood and gives rise to "red rot". The Forest Products Laboratories of the Forestry, Branch of the Department of the Interior recently made a series of tests to determine the effect of "red stain" on the strength of the timber. The results of these tests show that no diminution of the strength results from this condition and where the appearance of the wood is not important there should be no hesitation in employing it in timber structures.

It isn't a good plan to allow your regrets for yesterday to overshadow your hopes for tomorrow.

Hydro-Electric Developement

As applied to the Pulp and Paper Industry.

BY W. L. Barrows, Hydraulic Engineer H. S. Taylor
Limited, Montreal, Quebec.

In a recent article by Mr. Zimmerman, a colleague of Mr. Barrows, he brought out the various phases of the difficult situation where the construction staff and the operating staff come in contact. It is a valuable article. —Ed.

In any modern Pulp & Paper Mill electric power is essential, and in mills producing newsprint or other similar grades, the demand is in such quantity that its cost, if supplied through energy other than water power, would be prohibitive. Hydro-electric energy, therefore, is in demand, and the characteristics of its development, as well as the load itself, are in many ways special for pulp and paper production.

The engineering features involved in the design of a hydro-electric power development where the demand is for a general industrial and lighting load are well established and while no two such developments are subject to similar conditions, they have the same general characteristics. The factors entering into the design of this type of plant have, therefore, become well known; both technical and practical data are extensive, and its development is specialized in the hydro-electric engineering profession in general. When, however, a hydro-electric development is to be designed solely or primarily for the manufacture of pulp and paper, the problem differs in many ways, and special conditions arise that greatly modify the usual development, and it is these conditions that call for a thorough knowledge of the requirements of the pulp and paper industry on the part of the engineer responsible for the development.

When the engineer is called upon in connection with electric power for pulp or paper manufacture, he will generally find himself confronted with one of three situations, these three situations being,—first, use of purchased power for an existing plant, second, the selection of pulp and paper making equipment to utilize an existing power supply, and third, the installation of a power development to supply either an existing plant, or one that is to be built.

In the first case he will quickly learn that the standard form of power contract is not in general applicable to a pulp or paper mill load and that it may be necessary to rewrite entirely the major part of the standard contract form to conform to the conditions under which the power will be utilized. Anyone who has arranged for the purchase of power to supply the manufacturer of paper, has been impressed by the wide variations from the conditions that prevail for the ordinary user of electric power. Standard power contracts are written in such a form that with slight modification they can be made to apply to almost any class of service, and the fact that such an amount of revision is necessary in the case of a pulp and paper mill, indicates the difference that exists between the supply and use of its power and that of the general requirement.

In the second instance the engineer has more latitude, and by the judicious selection of his mill equipment will often be able to secure a more favorable contract than is possible in the first case. He will, however, discover that the Power Company can meet his requirements only with great difficulty, and that generally he must adjust the operation of his mill to a greater or less extent to accommodate the conditions imposed by the Power Company.

We need no more than mention these first two cases, since it is obvious that in both instances we have primarily a paper mill problem, rather than a power problem.

In the third case when either the power development, or both the power and the paper developments are new work, the development should be treated as a whole. The engineer must keep constantly in mind the conditions that will exist at the mill, and so select his equipment that the completed project will operate the most efficiently as one unit, efficiency of either the mill or power station taken individually at the expense of the combined efficiency being undesirable. It is, therefore, essential that the hydro-electric engineer in charge of the design of the power station have complete knowledge of the power demand, and at the same time be familiar with the process to be followed at the manufacturing end of the transmission line, since he cannot otherwise properly execute his portion of the work.

It is often the case that a hydro-electric station will be contemplated by a paper manufacturer for delivery of power for the manufacture of a specified quantity of pulp per year, rather than a definite constant load, and with such a condition to meet, the extent and type of the development cannot be determined from the data usually found sufficient for this purpose. It is at once apparent that the engineer must consider the power station and grinder room as a single unit in determining the proper generator capacity, this capacity being directly related to seasonal flow and pondage, grinder room capacity and wet machine capacity for the lapping and storage of pulp for use during the period of reduced stream-flow. This instance is cited because it shows clearly the intimate relationship between the power station and the mill; in other cases the intimacy is not so obvious, but it is nevertheless present and although, because it is not so pronounced, it is sometimes entirely overlooked. It is of extreme importance that the mutually dependent factors all be taken into consideration at the time the design is made.

Of the several factors that will be influenced by the consumption of the power in the manufacture of pulp and paper, the most important are the power factor and load factor. These two factors are found to be entirely different from those prevailing in the ordinary development and can be intelligently established only with a thorough knowledge of the mill operation. Their final determination will influence the type and capacity of the generators, transformers and even transmission line very materially, and unless they are given the consideration they deserve, the result will be a considerable expenditure for unnecessary equipment or a condition that will not permit of an economical operation of the plant.

In the modern electrically driven pulp or paper mill, it is possible, by the installation of properly designed synchronous motors, to give the operator complete control of the power factor, which he can then carry at a point approximating unity, and it is here that we find the first variations from the standard practice followed generators to operate at from .90 to unity power factor is very rare outside the paper industry, but with the proper selection of equipment this power factor may be maintained by the intelligent operation of the grinder room, with a considerable saving in the total cost of the electrical installation, considered as a whole.

The advantage of operating the station at unity power factor may be questioned when it is recalled that the wattless component absorbs no power from the water wheel except that due to decreased efficiency and increased excitation demand; the advantage, however, lies in the fact that the generator to deliver a given quantity of electrical energy at unity power factor can generally be constructed at considerably less cost than one to deliver the same power at say 75 per cent. power factor, and it should be kept in mind that a similar reduction in cost of equipment supplies to the transformers and transmission line and to the step-down transformers at the mill sub-station. It is interesting to recall here that interest, taxes and depreciation on the initial investment amount to 75 per cent to 85 per cent of the total operating cost of a power station of average capacity, so that a reduction in the first cost of a development has a great deal more influence on the annual operating cost than it would have in an industry where labor is the predominant item in the cost of the product.

The load factor in a paper manufacturing plant depends to some extent upon the nature of the product, but generally speaking the mill load is remarkably uniform, and with proper superintendence the peak load should be but slightly greater than the average load. Here again we find a great variance from the load carried by the average public utility station. It is no unusual thing for them to operate under load factors as low as 30 to 35 per cent, and in some cases as low as 25 per cent, and it is at once apparent that under such widely different load conditions, the installation will be correspondingly modified.

As a general rule a small load factor leads to the installation of numerous small units, to provide for operation under various load conditions, without great loss in efficiency, while the pulp mill load permits of the operation of a few large units with the same results. The increase in size of the hydro-electric units and the resulting decrease in number of units, generally makes desirable a somewhat special arrangement of the power station eequipment, so that the layout is in many respects quite different from that usually encountered. The determination of the number of units in any case will require a study of the power demand, and here again, it is essential that the engineer be familiar with manufacturing requirements of the industry.

Generally the proportion of lighting load to the total mill load is much smaller than that found in commercial developments, and while this usually has no bearing on the selection of equipment, it will sometimes influence the design; the absence of a heavy lighting load gives more latitude in the choice of frequency, and occasionally, when existing conditions demand a lower frequency, this may be of value.

In pulp and paper mills it is desirable and customary to use a higher voltage on the larger motors, and a lower voltage on the smaller equipment. The amount of power to be supplied by each of the two circuits must be determined from an analysis of the load, and the conclusion reached will often determine the type of transformer equipment, and frequently is an important factor in the selection of the generator and transmission voltage. It is obvious that this step in the work requires a general knowledge of pulp and paper manufacture.

The extent of the mill load is very readily determined, and if the stream flow is sufficient at all times to produce the necessary power, the number and size of the hydro-electric units are readily established, and the problem is much simplified. When the mill includes a Groundwood Department and the power demand is comparatively large, it is not usually the case that sufficient continuous power can be obtained from the development without extensive work to provide for the storage of water for use during periods of small flow. It frequently develops in a case of this kind that it may be more economical to operate the groundwood mill during periods of flood flow to produce a surplus of groundwood pulp to be used when power for manufacture is not available, and on some streams no other course is possible. This condition leads to wide variation from the ordinary practice in hydro-electric engineering, since the installation is made to develop the maximum flow of the stream rather than the mean flow, and what would ordinarily be considered ''over-development'' is good practice and often is necessary to satisfy the total annual power demand.

When a situation of this kind develops it is highly important that the engineer in charge of the design of the hydro-electric station be competent to consider the pulp mill installation as a part of his work, as this problem then becomes one that requires a full knowledge of the conditions under which groundwood pulp is produced, and without this knowledge it cannot be expected that he will arrive at the truly economic design. In determining the extent of the hydro-electric development, the factors involved include, in addition to those ordinarily involved in design of any station, the cost of the groundwood installation per ton, including wet machines and storage facilities, the cost of recovering the groundwood from storage and its conversion into slush pulp; the excess cost of operating a groundwood plant seasonally over the cost of continuous operation, and many other less important items which will modify the cost per ton of the finished product. It is these factors, weighed one against another, that determines the size of the development, both at the power station and at the mill, it being apparent that each project presents an entirely new problem, and that the conclusion reached in one instance must be entirely discarded when a second installation is to be considered.

The design of a paper mill power station is, from an engineering standpoint, more than a hydro-electric development. It is in reality a problem in paper mill engineering and presents many questions demanding a knowledge of the processes used in the manufacture of pulp and paper similar to any other phase of paper mill engineering; and serious after effects are very liable to follow if the station is treated as an independent unit and designed and constructed without taking into full consideration the load it is expected to carry.

NEWSPRINT FOR LONDON.

Quebec, March 7. — J. Leonard Apedaile, general manager for Price Brothers Company, Limited, stated here tonight that the first shipment of an order of 13,500 tons of newsprint which his company has contracted to supply to the London Daily Express will be made this month. The first shipment will consist of 1,000 tons and will be made by the Cunard-Donaldson Line.

The total value of the shipment is approximately $90,000.

Pumps and Their Characteristics

By E. F. DOTY.

(Continued from last issue.)
Chapter VIII.

Air Lift Pumps.

These are so named because compressed air is used in forcing water from a low level to a higher one by displacing water in the pipe or tank with air under sufficient pressure to cause the water to flow up to and through a discharge opening located at a higher level.

The air lift is more properly called a pumping system than a pump for the reason that the only machine necessary in the operation which resembles a pump is the air compressor which is used for developing the necessary air pressure.

The other equipment required consists of a properly arranged system of piping and a tank to serve as a reservoir for the compressed air and to provide a supply under steady pressure for acting on the water to be lifted.

Figure 40 shows the usual arrangement of an air lift system. In this figure A indicates the air pipe from the compressor, V a safety valve, and G a pressure gauge.

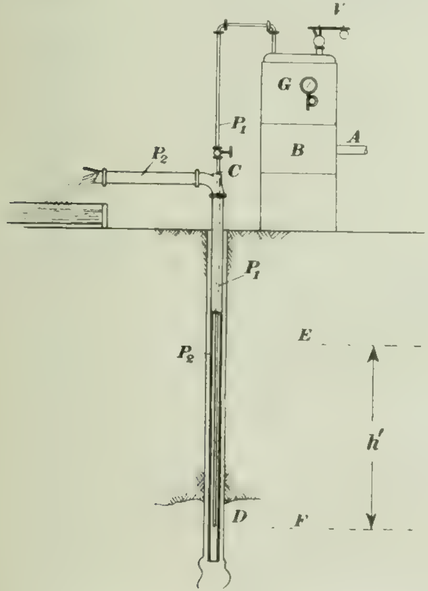

Fig. 40.

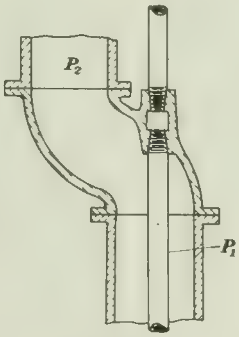

Fig. 41.

From the storage tank B, which is provided with pressure gauge and safety valve, the air is conducted through air pipe P_1 to the head of the discharge pipe at C; from there it is continued down to a point D near the bottom of the discharge pipe P_2. The well shown in the illustration is of the cased type and forms the discharge pipe; it is driven or let down through the earth into the water supply below the surface and the lower end is submerged below the normal water level so that the water in the well or discharge pipe stands at E below the point of discharge and the depth of immersion from E to F is called h′.

The figure shows how the air is carried down inside of the main pipe through a smaller pipe which discharges the compressed air directly into the discharge pipe near the bottom.

Figure 40 shows the system with an open discharge pipe delivering into a flume or open canal at the ground level. When conditions require it, the discharge pipe P_2 may be arranged as in Fig. 41 to carry the water upward to a tank or to any point within the pumping limits of the apparatus where its delivery may be required, P_1 is the air pipe.

Another typical arrangement of the air lift is illustrated by Fig. 42 in which the air pipe is carried down alongside of the water discharging pipe and the compressed air is introduced into the latter at the proper point below the water level. The diagram of an air lift illustrated by Fig. 42 graphically describes the arrangement and proportions of an air lift system with measurements for a typical installation, the characteristics of which are as follows:

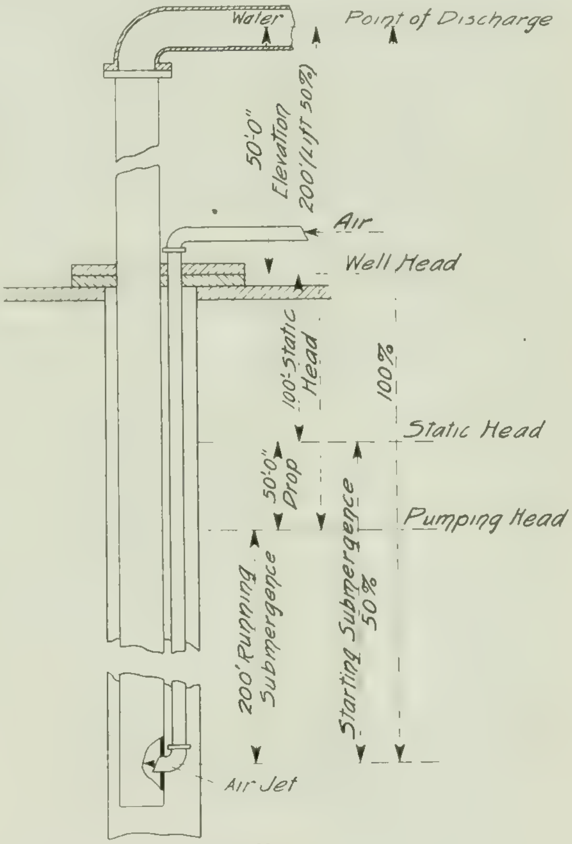

Fig. 42.

Static Head is the distance from the surface of the ground to the standing water level in the well when not pumping.

Drop is the distance the water recedes when the well is delivering a certain quantity of water.

Elevation is the distance above the surface to which it is desired to deliver the water.

Lift consists of the static head plus the drop plus the elevation.

Submergence is the depth that the air pipe is submerged below the pumping level of the water in the well. There are two classes of submergence—starting submergence, which is temporary, and running submergence, which is the important factor in any pumping proposition. It is usually expressed in terms of the total length of the water column from the point where air is introduced to the point of discharge. Thus 50 percent submergence means that the total lift, or head, and the submergence are equal. The necessary percentage of submergence varies in accordance with the lift; low lifts require proportionately more submergence than high lifts. As the lift increases the necessary submergence decreases. The range of these percentages is found within the following limitations:

For a lift of 20 feet, 66 per cent.

For a lift of 500 feet, 41 per cent.

Installations of air lift systems may be arranged with a centrally located air compressor plant and the wells at a distance from it when necessary; one compressor station being used to furnish compressed air for any number of wells. In general practice the air pipe lines are arranged so that the air travels through them at a velocity of from 2,000 to 4,000 feet per minute and the area of the compressed air pipe is usually 17 per cent or one sixth the area of the discharge pipe.

The usual limit of head for an air lift system is placed at 200 feet; greater lifts may be obtained although the efficiency is usually reduced and the consequent cost of operation is increased. For this reason, when it is necessary to raise water to higher heads and when the best efficiency is to be maintained it is advisable to divide the total lift into two or more stages or as this is commonly called the smployment of the "Booster System" of compressed air pumping.

A typical arrangement of air lift pump and booster is shown in Fig. 43. This system provides for handling the water from stage to stage with a pumping equipment and air pressure at each stage and a deep well pipe reservoir in the main well. With this arrangement of pumping for high lift conditions, the efficiencies secured at lower lifts may be obtained. In considering the efficiency of an air lift system it should be understood that the efficiency is the ratio of the work done; that is, the weight of the water lifted against the total head, to the work done, or power required to compress the air used in operating the system.

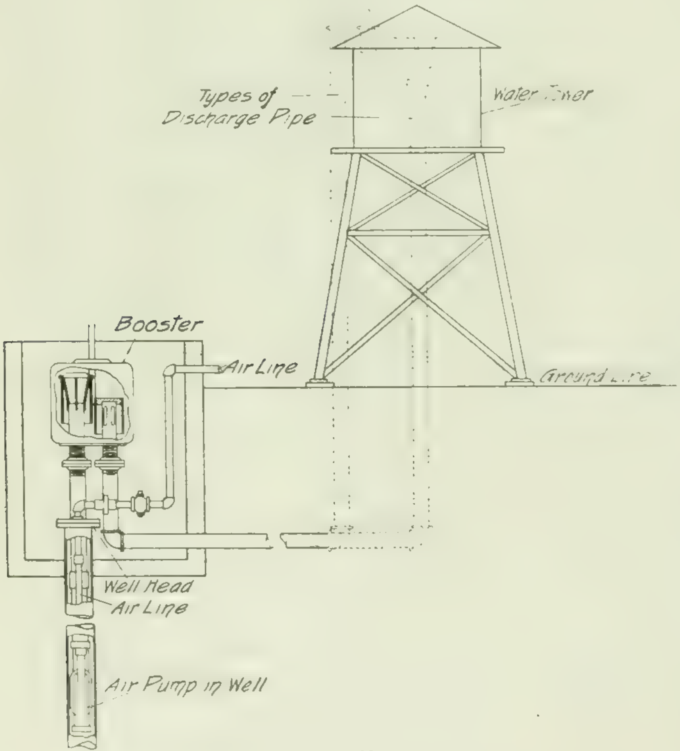

Fig. 43.

Efficiencies of air lift systems will vary generally all the way from 20 to 50 per cent, in some cases higher efficiencies are obtained but in general an average of 35 per cent will bet a safe estimate. These efficiencies will be considered low by comparison with those which may be obtained with other types of pumps but the advantages of being able to raise the water from sources of supply far below the ground level without the use of moving parts within the well and the simplicity of the air lift system will compensate for the lower efficiency in a great many installations and for these reasons the air lift has been quite generally adopted as standard for several important classes of service which include private, municipal and factory water supplies where the water is obtained from wells.

To calculate the air volume and size of compressor required, the following formula, in part suggested by Mr. Edward A. Rix, A.S.M.E., may be used, which closely approximates average practice. The annexed table also shows the value of "C" under various heads with the proper submergence:

Formula:

$$Va—.8 \quad \frac{h}{C \log \frac{H+34}{34}}$$

Va—Free air in cubic feet (actual) required to raise 1 gallon of water.

h —Total lift in feet.

H —Running submergence in feet.

C —Constant as given in table.

Lift in feet (h)	Constant.
10 ft. to 60 ft. inclusive	245
61 ft. to 200 ft. inclusive	233
201 ft. to 500 ft.	216
501 ft. to 650 ft.	185
651 ft. to 750 ft.	156

The next calculation in order would be to find the starting and working pressure.

Starting Pressure—depth of foot piece in well less the static head x .434.

Working Pressure—depth of foot piece in well less the pumping head x .434+friction in air pipe+2 lbs. back pressure in nozzle or foot piece.

The amount of free air required to deliver the water varies somewhat according to several authorities. An average of these ratios is 4 cubic feet of free air to each cubic foot of water lifted; the air being compressed to the proper pressure or density to raise or force the water against the pumping head or lift.

The air lift is a displacement pumping system and the discharge of water is intermittent due to the presence of the compressed air in the discharge pipe. In some systems the air does not mix with the water while flowing through the pipe line but acts on it like a piston of the same diameter as the internal diameter of the pipe, the discharge consisting alternately of a shot of water and a shot of compressed air released to the atmosphere. This is the so called "slug system" of air pumping; with the Saunders system we have a combination of the slug system and also a mixing of the air and water which is within the discharge pipe; with the latter system the solid water surrounding the discharge pipe assists in raising the water within the discharge pipe; because, due to the presence of the air, the rising column is lighter in weight. By this method somewhat higher efficiencies than stated above are obtained.

The flow is usually sufficiently rapid with either system so that when discharged into the atmosphere it has the appearance of a solid stream of water flowing from the discharge pipe.

(To be continued.)

PROCEEDINGS OF THE TECHNICAL SECTION.

Report of the Annual Meeting.

(Continued from last issue.)

MR. KELLOGG: I just received a report from the McGraw-Hill Book Company yesterday with reference to the royalties. The statement is that of the first two volumes McGraw & Hill have sold 1,156 copies, and have paid us royalty on that number, which we think is doing exceedingly well in the view of the fact that there is a comparatively small demand for the first volumes and that McGraw-Hill are not doing any advertising until the third volume is available.

MR. CARRUTHERS: Would you mind conveying the information you gave me this morning in regard to the third volume?

MR. KELLOGG: The status of the third volume yesterday was this: There will be nine sections of volume III; seven sections are already completed and the cuts and plates are all made, and ready to run. With regard to section one of volume III, the page proof was sent to the editor on January 20, but the publishers had not got it back up to yesterday. In regard to section 3, the manuscript was received by McGraw-Hill on January 10 (Mr. Stephenson says "December 29") and they returned the galley proof on January 16.

The book will probably be out in about three weeks after the proofs get back. They are not losing any time although they were threatened with a tie-up about three weeks ago in consequence of the engravers'strike.

MR. CARRUTHERS: Mr. Kellogg, would you please explain to those present the matter of the price of volume III? Messrs. McGraw-Hill were to give us some information on that subject.

MR. KELLOGG: That is a matter we will have to take up with the joint executive committee. The contract with McGraw-Hill provides that the retail price of the book shall be approximately one cent per printed page and, in accordance with that, the price of the first two volumes has been around $5. They run pretty close to 500 pages. Volume III exceeds the original estimate by a little over 100 pages. It will make a volume of about 640 pages. It will be necessary, in order to avoid loss to the publishers, to set a retail price of probably $6 on volume III. But you are not paying a cent more than you are getting value for because you are getting 140 pages more than we anticipated at the outset. As to volumes IV and V, the price of course will be determined by the final number of printed pages which we cannot quite foretell as yet. It is very desirable, I think, speaking as a member of the Committee, that the final price of the entire set shall come down to $25 if we can get it down to that figure. Whether we shall have the number of pages in volumes IV and V to permit that I do not know. I think it will be necessary to have a price of $6 for volume III.

MR. E. B. WARDLE: What becomes of the royalty; how much is it; how is it handled; does it go to the two associations?

MR. KELLOGG: The royalty, by the terms of the contract, and by authorization of the United States and Canadian Sections, is to be held by the Joint Executive Committee. It goes into a special fund and it is the intention to set it aside to be available, if necessary, for a revision of the books from time to time. The royalty is going into a special fund and it will be employed on some good work. It amounts to ten per cent of the list price; that makes fifty cents per volume on the first two volumes and sixty cents per volume on volume III if the price is $6.00.

There is $428 in the bank now to the credit of the fund. This is a subject that the Joint Executive have talked over for some time and I think the opinion is that the fund should be held over for future use; not for the preparation of manuscript.

MR. CARRUTHERS: It will be understood that in dealing with a set of text books for an industry which is as progressive as the paper industry there will have to be a revision from time to time and we are very fortunate in being able to have each of these sections paged individually; that is, each section is complete, and if we desire to revise any particular portion of these books, we do not have to destroy all the matter that may have been printed in advance for the rest of the sets. I think we do wisely in building up a reserve fund to take care of any revision that may be found desirable from time to time.

MR. STEPHENSON: In regard to the size of volume III, which Mr. Kellogg has just referred to, I would like to say that the price of the fifth volume can be pretty fairly controlled by limiting the size of the book if it is thought wise to do so. The fifth volume, as at present outlined, contains these sections: The making of handmade papers, the tub sizing of papers, the finishing of papers, the making of special papers and boards (that is the variation in fundamental operations which are necessary to produce a certain on board, such as blotting, greaseproof, felt, etc.) The next section is the testing of paper, and another is devoted to coated and other processed papers. These operations deal with the actual manufacture. Another section contains a dictionary of paper mill terms and there is a final section on general mill equipment, such as pumps, the generation and distribution of steam, water supply, the transmission of power, etc. Then, there should be an appendix with certain tables which are frequently referred to by men in a paper mill. That includes a number of sections which are not absolutely essential to the manufacture of paper, but which are desirable. If the Technical Section feels that the price of the books as a set should be kept within the estimate of $25, the editor would like to have an expression of opinion as to whether they want to do that by cutting out some of the sections, or as many as may be necessary. An expression would be helpful to us as to whether the Section would prefer to include all the material outlined, and let the price be regulated by the material furnished.

The publishers have asked for an estimate of the number of papers to be included in volume IV, and, on going over that carefully, it looks to me as if it would come between 500 and 550 pages. Most of the manuscript is in and except for the variations in space occupied by illustrations, there are about 500 pages of type and there should be an allowance of ten per cent more for the illustrations. Of course, there will be a great many illustrations in some sections, and practically none in others. That is the way it looks at present. Volume IV should certainly come within $5 and volume V could be trimmed to bring the price down within that if it is thought advisable to do so. I am of the opinion, however, that the prices of printing are such now, and are tending in such a direction, that the publishers could bring out this set of books, including volumes III, IV and V, for a total of $25, and including everything we want to put in them.

MR. KELLOGG: There is very little decrease in the cost of printing so far in New York.

MR. CARRUTHERS: I suppose that volumes IV and V will not be completed for some time. Was it your opinion that you should get an expression of opinion here?

MR. STEPHENSON: Yes, as to whether we should trim out some of the matter in volume V to keep the price inside of $25, or whether we should put in the material as planned and let the price come as near $25 as we can keep it.

MR. CARRUTHERS: Is there any expression of opinion?

MR. CROSSLEY: I move that it be referred back, with power to act, to the Joint Executive Committee on Text Books.

MR. CARRUTHERS: It has been moved by Mr. Crossley, seconded by Mr. Wardle, that the matter be referred back to the original committee.

Motion agreed to.

MR. WARDLE: I would like to move that a vote of confidence and of appreciation be extended to the Text Book Committee for the excellent manner in which they have carried on this work.

MR. BRYANT: I beg to second the motion.

Motion agreed to.

CORRESPONDENCE COURSE.

MR. CARRUTHERS: The next matter to be dealt with is the second portion of the report of the Education Committee which deals with the letter from the Industrial and Educational Publishing Company. I may just say in this connection that I believe that if the industry could be relieved of the responsibility of undertaking a system of correspondence instruction, and if that could be undertaken by an independent body, it would be to the advantage of the industry because, knowing something as I do about correspondence instruction, I believe that the overhead to carry on a system of instruction for one industry alone would be so high that it would bear rather heavily on the student. I see that Mr. Harpell is here; he is the President of the Industrial and Educational Publishing Company and I believe it would be desirable to have a word from him in this connection.

MR. J. J. HARPELL, President and Managing Director of the Industrial and Educational Publishing Company, Limited. Mr. Chairman and Gentlemen, the subject of industrial education is one on which Mr. Carruthers or I could talk for a week but I am going to confine my remarks to the application before you, which is a request that you leave this educational work with us.

It seems to me that the work to be done following upon the publication of your text books naturally falls into three divisions.

First—There is the propaganda necessary to interest the managements of the different pulp and paper mills. This is the easiest of the lot. There is also the propaganda necessary to interest those who are to be benefited by the courses of education based upon your text books. This is the biggest end of the work.

Second.—There is the work of organizing definite classes in the community or in the mill, or both.

Third—There is the work necessary to the direction and assisting of these classes and to the giving of individual instruction through correspondence courses where classes do not exist or where workmen are studying special subjects that are beyond the scope of the class work in the community or the mill.

The first division requires no further explanation by me this morning because, as you know, the conduct of this work will depend entirely upon our ingenuity in devising ways and means of arousing interest by personal solicitation and otherwise.

In connection with the second division it is my opinion that the work in connection with your text books should begin with the last two years in the public schools of the district where the mill is located. The educational act of Ontario and a number of the other English speaking provinces already provide for the establishment and maintenance of such classes without requiring any private subscription whatever. All there is needed here is to collaborate with the Educational Department of the Province and the local Educational Board of the Community to have such classes established.

In the Province of Quebec the Hon. Mr. David has already introduced an Act in the Legislature which would provide for establishment of such classes along similar lines to those already provided by a number of the English speaking provinces. Such classes of course, will require to be specially organized and your text books accepted by the Educational Departments of the various provinces. They could not be conducted as part of the Public School although there is a suggested change in the elementary school curriculum in the Province of Quebec which if put into effect would provide that at least an hour a day may be given to the teaching of subjects pertaining to the industry of the community.

Where possible there should be a night class or a part time class organized in the mill and conducted by some person either in the mill or in the community outside of the mill, capable of giving instruction through your text books. You may know that every province makes provision for the establishment and support of such classes. The Province of Ontario pays 75 per cent of the maintenance cost of such classes and a considerable portion of the cost of equipment, and also provides that the balance of the expense shall be provided by the local Educational Board.

I have already visited a number of communities where the principal industry is the manufacture of pulp and paper and I find a very lively interest manifested by the local school boards and the mills in the proposed educational work.

The third phase of the work, namely, the giving of individual instruction by correspondence, is one which, to my mind, may be very considerable at the start and will rapidly grow into larger and larger proportions as the students get away from the elementary courses into the studying of special branches of the manufacture of pulp and paper.

Most of you know how much easier it is to organize and design than it is to put into execution. The administration of this work is going to be directly proportionate to the calibre of the men in whose hands it will be placed. We have been very successful in our efforts to get the men suitable for this work. We have secured for the head of this work. Prof. John T. Hoyle. Mr. Hoyle is a Canadian. He took his course at McMaster University and finished at Rochester. After graduating he went into the printing industry. From there he joined with the International Correspondence Schools where he rapidly rose to the position of Editor of Text Books. From there he went as superintendent of the Printing Plant and Editorial Work of the late Elbert Hubbard at East Aurora. Five years ago he was appointed Professor of English at the Carnegie Institute of Technology, Pittsburgh, Pa. When the head of the Department of Printing at that Institute left two years ago this position was also given to Mr. Hoyle, so that previous to coming with us he was Professor of Editorial Studies and Printing at the Carnegie Institute of Technology, Pittsburgh, Pa. As many of you know, we have also secured the services of Mr. Crossley, Chairman of your Education Committee. We are going to add a third to look after this work, who in all likelihood will be a French educationalist—a man who can translate your text books into the French language because this will be absolutely necessary in the elementary classes of French districts. No doubt when they have passed the second of your books they will be able to handle their lessons in the English language.

MR. CARRUTHERS: Thank you, Mr. Harpell. At present we have no method whatever for carrying on this work, so that it become a question as to the desirability of allowing Mr. Harpell's company to do it for us. There may be some gentlemen who want to make some inquiries, suggestions or remarks, and the discussion is now open.

MR. HARPELL: In case there may be some persons here who are not familiar with the Industrial and Educational Publishing Company I may state that this company is the owner of the Pulp and Paper Magazine of Canada. We have already a very strong department there giving service to the pulp and paper industry, headed by Mr. Stephenson. I neglected to mention that in the matter of the service we will continue to give to the pulp and paper industry, Mr. Stephenson will be a very important element as he always has been.

MR. MASON: In view of the importance of this part of the educational program, would it not be advisable to refer this to a special committee to report back to this section tomorrow, because there are a great many things to be considered which perhaps cannot be done as well in the open meeting.

MR. CARRUTHERS: I believe that is a good suggestion. I will undertake to name a committee to act in that capacity now, if I may. I will name Mr. Bryant, Mr. Costigane, Mr. Mason and Mr. Crossley.

I think the suggestion that we have a committee to run over this proposition in a general way before we pass it on to the parent body, is a very good one.

Motion (Mr. Mason) agreed to.

This ended the interesting discussion of the report and current work of the committee on Vocational Education.

The next installment will include the remainder of the reports of committees and the discussion of the paper by Messrs. Blair and Cameron on "Clean Water as a Preservative for Pulp in Storage.

FEDERAL BOARD TO TEACH PAPER MILL FOREMEN.

The unusual experiment in vocational education, carried on jointly by the paper industry and the Federal Board for Vocational Education, has been so successful in the South, that it will soon be under way in other important paper making states.

A special conference for the training by the federal and state authorities of foremen, like that initiated in a North Carolina mill, has been started in Erie, Pa., and big paper mills in New York, Massachusetts and Wisconsin are contemplating similar conferences.

The establishment of training classes for foremen is a preliminary activity undertaken by the paper industry, which has for three years been preparing the details of technical educational courses for its workmen.

The foremen's course, however, is entirely separate from the technical course mapped into a general system of education for the men in the mills. The preparation of text books by the Technical Associations of the United States and Canada has been financed by a fund of $40,000 raised with the assistance of the American Paper and Pulp Association, representing the paper manufacturers in the United States and the Canadian Pulp and Paper Association, representing the manufacturers across the border.

The foremen's course was established first in the mill of the Champion Fibre Co., at Canton, N. C., and lasted twenty days, with foremen giving about six hours a day to class work, on company time. The Federal Board for Vocational Education handled the instructional work in coooperation with the State Superintendent of Vocational Education, and the same organization has now started a similar course in the Erie, Pa., mill of the Hammermill Paper Co., in cooperation with the Pennsylvania Superintendent of Public Instruction. There is a lively rivalry between the mills in New York, Massachusetts and Wisconsin for the honor of being third among the nation's paper mills to establish this course for the training of foremen.

NOVA SCOTIA FISH DISLIKE PULP.

During a visit of a representative of the Pulp and Paper Magazine to the mill of the Sissiboo Pulp and Paper Co., at Weymouth, N.S. there was an investigation of a complaint from fishermen that the white water, bark, slivers, etc., from the pulp mill interfered with fishing further down the river. Two Government inspectors were detailed to look into the problem. The complaint stated that rubbish from the mill had a tendency to fill up the nets and otherwise interfere with the smelt fishing industry. The inspection carried on by the Government men delegated by the Department of Marine and Fisheries found after an investigation lasting two days that the mill officials were doing their utmost to prevent anything from going down the river that would interfere with the fishing; in fact Mr. Frank Ouellet, manager of the Sissiboo and Clyde River mills spared no expense in improving the situation. The Government inspectors made some suggestions which the management was glad to carry out.

The groundwood pulp mill at Weymouth is the large plant formerly carried on by Mr. G. D. Campbell and his sons but the war took so costly a sacrifice that Mr. Campbell has found it difficult to carry on without the anticipated assistance of the sons he lost in the cause of Empire and humanity, and recently disposed of his pulp mill to Becker & Co. The mills are several miles up the river from the fishing grounds.

THE BABSON INDUSTRIAL CLOCK.

The Babson Industrial Clock offers much encouragement to the paper and pulp industry. This clock lists the main industries and shows by the position of its hand what industries have gone through the process of liquidation and are approaching normal conditions and what ones must yet liquidate. Those that have already liquidated, in order, are: silk, food products, leather and shoes, woolen and cotton, clothing, slaughtering and meat packing. The hand now points to paper shows that within a short time conditions in the paper industry will be greatly improved. Not yet liquidated are: building materials, railroad equipment, iron and steel, automobiles, and coal and oil.—The Beater.

Don't fool yourself into mistaking activity for efficiency. Most of the time it isn't.

Use of Creosoted Wood Block Floors in Pulp and Paper Mills

BY LAMBERT T. ERICSON, Chief Engineer, The Jennison Wright Company, Toledo Ohio.

The selection of suitable floors in the pulp and paper industry has been, in the past, one of the most difficult problems encountered by engineers in the design of the modern paper mill.

The conditions encountered are extremely varied and are in most cases very severe. The traffic is heavy and in some departments, the floors are continually subjected to the attack of acid solutions. Portions of the floor are flooded with water and other portions are subjected to extremely dry, heated conditions.

Concrete not only disintegrates quickly under traffic of this sort but it is difficult to repair and also presents a tiresome, unhealthy footing for the men.

Creosoted wood block floors have been extensively used in a great many of the modern plants recently erected and the success which they have attained has been universal. They have a great many attributes, which make them especially adaptable for the paper industry. They are impervious to acid solutions. They can be installed with waterproof bituminous binders, thereby forming a waterproof surface and they will stand up under the heaviest and most severe conditions of trucking. They afford a comfortable footing for the men and are non-conductors of heat. They are also easily repaired and afford an opportunity for changes in flooring construction without any difficulty.

In order to insure success, it is essential that the floors be installed by those who are expert in wood block flooring construction. It is also essential that the conditions be carefully analyzed before the specifications are drawn for it is impossible to draw up a general specification for a creosoted wood block floor which will meet the varied conditions encountered in this industry.

A Good Floor at the Wet End of a Board Machine.

It should be understood in the beginning that it is impossible to impregnate wood with oils so that they will be impervious to moisture changes. Wood changes in volume with its moisture content, and it is absolutely necessary to take this feature into account when the floor is designed. Those portions of the floor, which are to be subjected to water and acid solutions must be laid in a different manner than those portions of the floor which will be dry and heated.

All of the essential details of construction should be approved by the wood block manufacturer and the responsibility for the success of the floor should be centered on this one party. It is necessary that the floor be constructed by experienced wood block floor men who will guarantee their work.

Southern Long Leaf Yellow Pine has proved to be the most successful lumber used in connection with creosoted wood block interior flooring as well as creosoted wood block street paving. It is peculiarly adapted for a thorough penetration of the preservative treatment and its great density makes it practically indestructible under heavy traffic.

Creosoted wood block floors shold be installed over a concrete sub-base whenever it is possible to provide such a base. A solid heavy plank sub-floor will also serve as a suitable foundation. The blocks require an absolutely stable footing and they should never be placed on a vibrating or shifting foundation.

If a concrete foundation is used, the concrete should be brought to a true, smooth and even finish, exactly the depth below the finished floor level corresponding to the depth of the block to be used. The concrete should then be given a thin even coating of coal tar pitch or asphalt and the blocks should be laid directly on this coating after it has hardened; the joints between the blocks should then be well filled with a bituminous binder.

Floors to be subjected to wet conditions should be laid with ample provision for expansion in the blocks. The width and location of the expansion joints chould be carefully calculated and predetermined by the engineers.

Wood Blocks Make a Dustless, Clean, Durable Floor for Finishing Rooms.

While it is essential that the floors should be designed and constructed by those who are expert in that line, it is not a difficult matter to instruct the regular workman around the plant in the art of repairing or relaying the blocks, as far as the general run of maintenance requires it. There is no special equipment required and the work of the installation can be quickly and economically carried out at any and all times.

W. Fulton, Premier Paper Mill, South Africa, has arranged to issue 30,000 new preference capital by subscription at par through a London Stock-broker. The mill turns out wrapping paper first now and no doubt with the money about to come in a move will be made in the direction of producing newsprint. Just 50 tons a week can be turned out now.

The Wayagamack curling team won the Three Rivers Ship yard cup at the Shawinigan Falls Bonspiel, by defeating the Falls rink.

Mr. Joseph Dixon's Fifty Years' Work in the Mill

(Special Character Sketch From Our London Correspondent.)

Mr. Joseph Dixon, President of Peter Dixon & Sons, Ltd., Oughtibridge, owners of Spring Grove Mill near Sheffield, and the West Marsh Paper Mill, at Grimsby, —and one of the best known and most highly respected producers of newsprint and other papers in England —enters upon his 56th year as a papermaker in the British industry. Lord Riddell, a great London newspaper owner, who took such a conspicious part in the Washington Conference recently, and who also represented Great Britain at the Signing of the Peace Treaty at Versailles by the Germans and Allies, once spoke of Mr. Dixon, in my hearing, at a great London gathering of papermen, as "one of those old gentlemen of between 70 and 80 years who exuded prosperity at every pore." Those words were used when a little prosperity was being enjoyed and when the buyer was paying "his bit" extra to help recoup the seller on his raw materials obtained in war-time. Today the boot is on the other foot. But Lord Riddell and Mr. "Joe" Dixon, as he is known to papermakers, are very close friends. And the greatness of Lord Riddell's astuteness in matters concerning the State synchronises with Mr. Dixon's diplomacy and greatness in the matter of producing paper. They are both able men in their own spheres of work, and, curious to relate, they are both the wittiest after-dinner speakers one could wish to enjoy.

MR. JOSEPH DIXON.

Mr. Dixon is one of the oldest members of the British Papermakers' Association and he has risen to be its vice-chairman.

Worked For $2 a Week.

Mr. Dixon is now 73 yrs. of age and "hale and hearty." To see him in London looking up an occasional buyer, incidentally a friend, one would never take him to be the age he is. He started in the mill in 1866 making newsprint and his earnings reached $2 a week for 72 Hours. The $2 a week was then the standard wage; but a good deal of water has run under the bridge since 1866. It would take that amount nearly, to feed a mill worker for a day at the present time. However, Mr. Dixon persevered and fought all obstacles— he was out to win. In 1871 he became managing partner in his father's mill at Oughtibridge, near Sheffield, and I heard him say some time ago, "after 50 years I am still learning my lesson. It is extraordinary the amount of research and energy required in the manufacture of newsprint. New features reveal themselves every day." This is the solid opinion of a manufacturer after 55 years' experience— a gentleman who does not hesitate to speak openly and bluntly what he thinks, and what he knows from actual hard experience obtained in the past in the great competition to retain a position in the world's market.

I may be right—and I may be wrong—but I have an idea that Mr. Joseph Dixon is "Father" of the British newsprint trade of the United Kingdom. He is at all events chairman of the Newsprint Section of the British Papermakers' Association and he is the right man in the right place, because he will let nothing pass unchallenged when the interests of his confreres are at stake and what he does not know about newsprint production nowadays is not worth knowing.

Mr. Dixon's First Order.

As far back as 1871 Joseph Dixon booked his first order for newsprint and I have heard him say that on that occasion he felt a very happy man. The London "Daily News", which Charles Dickens edited at one time, gave him a contract to supply 2,000 reams at 9 cents a lb. From that year until about 1874 —it was the time of the Franco-German war—papermakers enjoyed a very fair amount of prosperity. But after the war was over the experience then coincides with the depression of today. There was a complete change from hey days to slump and the slump was brought about by the Germans and Scandinavians pressing the market. This state of affairs existed for close on ten years, when a change set in for the better. The slump today, unfortunately, is worse than the one of 1875, because, the depreciated rates of exchange in all Europe cannot be stabilized and the buying powers of the Colonies and Dominions are at a low ebb. But in many ways the depression at present is on a par with the one of 1875 1884.

Great Admiration For Canada.

Mr. Dixon is one of the papermakers who has strongly fought for the paper industry to be known, or classed as a "Key" industry and he is also a good supporter of the Safe-Guarding of Industries Act, which became law in the latter part of 1921. He is a man who believes in trading within the Empire and in the case of foreign imports he advovates a duty on them where there is similar production in the United Kingdom. That is to say, if a foreign country sends newsprint to the British market it should be taxed, because, England is a newsprint producing country,— with mills giving employment, paying taxes and rates, whereas, on the other hand, the foreigner may ship surplus mill stock to an agent in London and undersell the domestic product to the detriment of the domestic producer. It is against tactics of this nature that no industry progresses or thrives on undercutting. Today he is the victim of the depreciated currencies in Europe.

Sometime ago he stated that the Finnish papermaker could sell his newsprint in London at £10 a ton and still make a handsome profit out of it owing to the exchange. It is no wonder, therefore, that we have to-day close on 7,000 employees idle in the paper industry with such unfair competition.

For Canada Mr. Dixon has great admiration. In 1893 he visited the Dominion and no doubt there are many Canadians who remember him. He likes to see the products of Canada in the British markets and he admires the way things are done in the Dominion.

Canadian Ground Wood Better than Scandinavian.

Now Mr. Joseph Dixon is a practical man in the paper mill; his vast experience stands by him; he controls the mills bearing his name and is assisted by his three very able sons; he is a man who calls a spade a spade and can settle a dispute at the mill gate, if he likes, with any trade unionist. In other words, he understands papermaking from A to Z— from the buying of pulp and machinery up to the finished product of the mill and the selling of it. Mr. Dixon knows that if he makes a mistake it is going to touch his pocket and in these circumstances he is looked upon as a great producer for a market, which Mr. A. L. Dawe once described as "no place for weaklings or quitters." Now having the practical man, the seller of paper and the buyer of raw materials, it is interesting to hear what he has said about Canada. He has used tons and tons of Canadian pulp. He considers that Canadian ground wood is a much better fibre than the Scandinavian and he believes this result is obtained by better grinding in the Dominion.

No doubt this is one of the results of the large shipments of ground wood to the United Kingdom within recent years and Canadian pulp men should bear these facts in mind. Mr. Dixon thinks that the groundwood from Canada is suitable for British newsprint production, in order to compete with the foreigners in the English market.

In view of recent controversy on Canadian and Scandinavian pulps, Mr. Dixon's views should enlighten some of the writers in Sweden and Norway. As I already mentioned, Mr. Dixon knows from practical experience, what he is talking about. Probably it is the good newsprint made from the good Canadian ground wood that keeps him and Lord Riddell such good friends!

A New Year Message — And a "Tickler" for Canadians.

Mr. Dixon says when he attends some of the festive gatherings of the pulp men he always feels he is in the Lion's Den. At the Papermakers' gatherings I once heard Mr. Lewis Evans, the late President,— and whose father was one of those who formed the Association— say they were always glad to hear or see Mr. Dixon, whether he was right or wrong. This spirit depicts the true value of the friendship he enjoys.

The thought struck me the other day that I would ask Mr. Dixon if he had anything to say to Canada. He replied:

> "I wish all the mill men in Canada and my friends a Happy New Year. How would you fellows over there set about altering conditions if you had 8—A1 news print machines-4 of them Walmsleys best 156 inch, two absolutely new and never started and the other six running 350 feet for only 70 hours per week—and our neighbors newsprint imported, free of duty, passing our mill gate each week?"

no better: and all the time thousands of tons of

Here is a problem with tragic results following in its trail. This problem sums up the position of the British papermaker to-day—and his experience since 1920— in a market patronised by producers with practically no money market. We have a concrete case of what is going on— and we know that German mills are thriving on Government subsidities, while the Britishers are standing idle, with their 7,000 unemployed workmen, watching the cheaply produced foreign paper "passing our mill gate". What would Canada do? I know what they would do with a Government that don't quickly find a cure.

IMPORTANT WORK OUTLINED BY C. P. & P. A.

Last week was a busy period in pulp and paper circles in Montreal. A meeting of the executive council of the Association, on March 1, was preceded by meetings of the executive committees of the Woodlands and Technical sections. At the three meetings matters of considerable interest were acted upon.

The Woodlands section was arranged for a summer meeting sometime in July, when the members will visit, if it is convenient to their hosts, the Saranac Nurseries of the New York Forestry Commission, with side trips to private woods operations in the vicinity. The section has also arranged for the employment of a competent forester to carry on its affairs and advise members on forestry and logging methods. The executive council of the Association has approved of the proposal and authorised steps to be taken to provide the necessary financial support.

The Technical Section has made tentative arrangements for a summer meeting early in June. It is proposed to make a trip to Iroquois Falls, Ontario, and held the meeting in connection with an inspection of modern paper making plant of the Abitibi Power and Paper Company. The section has had under consideration the appointment of a practical technical man to manage its affairs. The executive council has given its approval to this step. But the section has deferred the inauguration of the undertaking to a later date. The executive committee carried the following as a committee to co-operate with the Industrial and Educational Publishing Co., Limited, on the establishment of a correspondence course on paper making, to be operated in conjunction with the text books now being issued under the supervision of the Technical Section—Messrs. Geo. Carruthers, Interlake Tissue Mills, Limited; O. F. Bryant, Laurentide Company, Limited; and F. J. Campbell, Canada Paper Company.

At the meeting of the executive council of the Association, several important matters were discussed and disposed of, amongst others being the entering into of arrangements with the Canadian Manufacturers Association for the joint use of a transportation bureau, with head office in the Board of Trade, Montreal. Mr. G. P. Ruickbie, the transportation manager of the Pulp and Paper Association, has transferred his activities to the C. M. A. head quarters in Montreal at which all former work on behalf of the pulp and paper companies will be carried on.

Mr. Geo. McKee reported to the executive council on the visit made by the deputation of paper manufacturers to the government at Ottawa to press for a preferential tariff with Australia. Mr. McKee stated that the Government had given assurances that active negotiations are now proceeding and that a successful termination is anticipated.

PULP AND PAPER NEWS

The Canadian Barking Drum Company through its Toronto office has sold one of its drums recently to the Temiskaming Pulp and Paper Co. Haileybury, Ontario, and another to the Hawk Lake Lumber Co. Ltd., Monteith, Ontario.

A little party of five was called together at lunch Monday at the York Club, Toronto, to discuss the relationship of the Pulp and Paper industry to Toronto University. It was quite informal. Those present were: the host, Prof. Lash Miller, Dr. Howe, Dean of the Forestry Department, Prof. Watson Bain, Mr. Geo. Carruthers and Mr. T. L. Crossley.

Judging from the question sheet of the present session of the legislature at Queen's Park, pulp mill matters will be aired considerably. Hon. G. H. Ferguson, Conservative Leader, has put in a request for all correspondence between the Government members and E. W. Backus concerning the Lake of the Woods pulp concession, White Dog Rapids water powers, English River pulp concession, and other matters concerning lumber and power companies. Mr. W. D. Black, Conservative of Addison, is asking about the Government's intentions in regard to applications by Mr. Backus since December 15th.

Mr. Black's question refers also to the resolution passed in June 1920 by the Ontario daily newspaper publishers, drawing attention to the position of the Backus interests toward requirements of newsprint for domestic purposes, claiming it to be contrary to public interest to grant further power or pulpwood concessions to those parties and, furthermore, asking cancellation of all pulpwood concessions in the development of which such parties were in default.

It is confidently expected that the well known interest of Premier Drury in forestry conservation will determine a strongly backboned attitude on the part of the Ontario Government toward all timber matters.

There are not lacking signs that the University of Toronto will take some practical interest in matters affecting the pulp and paper industry. A recent course of five lectures on this subject to students of the fourth year in Chemical Engineering was attended with sustained interest.

T. H. McDermott and S. Samuel, late of the Toronto branch of the Lincoln Paper Company, have formed the Samuel-McDermott Paper Company and are embarking in business in their own behalf. They have leased an office in the Cronyn Block, 71 Bay Street, Toronto, and will handle all kinds of wrapping paper, glassine, grease proof and allied lines.

Mr. McDermott was for 25 years with the Lincoln Paper Company and during the greater part of that period was manager of the Toronto warehouse. Mr. Samuel has been associated with the company for some 20 years on the sales force. Both gentlemen are well and favorably known to the trade and have many friends who will wish them every success in their new venture.

Mr. John Ball has accepted the position of manager of the pulp and paper division of the Bathurst Company, Limited. Mr. Ball was formerly manager of the pulp and paper mills of Price Bros., & Co. and has had a wide experience in the industry.

Mr. William (''Billy'') Whyte, 315 Melrose Ave., Montreal, has a new arrow for his bow. He has been appointed sole agent in Canada for the well known *Stoke* pulpstones, produced by Percy J. Turner, Ltd.

Encouraging word is received from Mr. L. R. Wilson, secretary of the Abitibi Power and Paper Co., who is recovering from a delicate operation on his throat.

Mr. John Wilson, Jr., who for the past fifteen years has been associated with the sales organization of the Dominion Bridge Company, and its subsidiary companies, the Dominion Engineering Works and the Structural Steel Company, has accepted the position of Sales-Manager with the Walsh Plate & Structural Works Limited of Drummondville, Que. Mr. Wilson assumed his new position on March 1st.

DRYDEN AND DON VALLEY WIN SHIELDS.

The winners and runners up in the 1921 safety competition were named at a meeting of the Ontario Pulp and Paper Makers' Safety Association held Thursday, February 23rd.

The accident figures for the year were tabulated by the Association's Secretary and Engineer, Mr. A. P. Costigane, and upon these figures the leaders in both classes were adjudged to be:

Class A.—Mills employing 200 persons and upward.

1st. Winner of Flag and Holder of Challenge Shield, Dryden Paper Co. Limited, Dryden; whose record was 24 non-fatal accidents involving lost time of 374½ working days or 2.31 days per full time worker.

2nd. Howard Smith Paper Mills Limited, Cornwall, with 43 non-fatal accidents involving lost time of 717½ days or 2.9 days per full time worker.

Class B.—Mills employing less than 200 persons.

1st. Winner of Flag and holder of Challenge Shield, Don Valley Paper Co. Ltd., Toronto, with the almost unique record of one non-fatal accident involving a loss of one day's working time which worked out to .02 days per full time worker.

2nd. Miller Brothers and Co. Ltd., of Glen Miller, with one non-fatal accident involving nine days loss of time or .028 days per full time worker.

Accordingly the winner in each class will be presented with a shield and a flag. The Shields will remain in the custody of the winners during the current year, but the flags will become the property of the winners for all time and will be a daily reminder to the employees of these mills of their success in heading the accident prevention list during the year 1921.

The contest is now in full swing for the year 1922 and evidence points to the fact that the trophies will be even more keenly fought for this year.

Great interest has been evinced in this contest and the results are very gratifying. Time saved is the money item that can be calculated. Who can tell what lives were saved, how many homes preserved, and how much happiness secured by the care exercised in competing for the shields and flags?

The presentations will be made by the President of the Ontario Pulp and Paper Makers' Safety Association at special meetings of the employees of the successful mills.

The shields in each class are handsomely mounted on wood sawn from a beam taken from the ruins of the original Don Valley mill which was the first paper mill in Ontario, and will be surrounded by plates with the

SIR FREDERICK BECKER OPTIMISTIC.

Sir Frederick Becker, chairman of Becker and Company Limited, England, and of Becker and Company of America, Limited, Montreal, is on a business visit to this country. He came via New York. In an interview with a Montreal representative of the Pulp and Paper Magazine Sir Frederick expressed some optimistic views regarding the pulp and paper outlook, particularly as it affects Great Britain.

As the chairman of the largest group of paper mills in the world, and also as the head of a very extensive organisation selling pulp, he is in a position to know whereof he speaks. "So far as England, is concerned," he said, "we have suffered considerably from dumping by countries where the exchange has collapsed. We have had dumping from Scandinavia and Germany, who sold all winds of paper at very low prices. The dumping of newsprint was chiefly from Finland, while Germany sent great quantities of kraft, much of it left over from the war. There has been a marked revival, and the British mills have now many orders in hand—in fact all departments are in full operation, except the bank accounts. Export business is picking up.

"Internal competition is very keen. There is no doubt that the price of paper will rise before the year is out. Over a number of years there will of course, be advances and falls, but I look for a general downward tendency, with an advance this year. The world is short of paper and my opinion as to the immediate future is based on this condition, coupled with an increase in the demand. Russia's revival will take care of the Finnish output, which has already commenced; Scandinavia is selling more paper than she can produce; and Germany will, I believe, soon absorb her own paper.

"I am also optimistic as far as the consumption of pulp in England is concerned. Finland and Germany have dumped a considerable quantity, the exchanges being the determining factors. It may be that England will continue to receive dumped pulp, according to the course of the exchanges, but on the whole I take a favorable view of the position of this commodity in England."

McNICHOL TO RUN MILL IN SIAM.

Mr. McNichol, who was Assistant Paper Controller for Canada under the War Measures Act, is going to establish and put into operation a complete pulp and paper mill for the Siamese Government, and afterward to train the natives of that country in the art of pulp and paper making. He is under a two-year agreement with the Government.

He expects to sail by the Melita on the 17th of March, going by way of England, Marseilles, Naples, Port Said, Colombo and Penang, thence by rail to Bangkok, the capital of Siam, which he hopes to reach about May 1.

This is the first departure in the direction of papermaking in Siam. The plan is to be a semi-commercial one, on a somewhat larger scale than the one established by the Canadian Government at McGill University in 1915, but on similar plans.

The object of this plant is simply to demonstrate what can be done in paper making with the materials available in that country, which consist of grass, bamboo and rice straw, and are similar to those used in India, where Mr. McNicol had 12 years' experience. In fact, Mr. McNicol says that experience explains his selection for this new post.

About two tons of paper per day will be the capacity of the plant. The intention is to demonstrate that the raw material in Siam is suitable for the manufacture of paper. Of this Mr. McNicol has no doubt. It is expected that, following the successful demonstration of practicability, a company will be formed to operate on a commercial scale. The initial plan will be paid for, both as to equipment and as to financing, and every other way, by the Government.

MR. CADMAN JOINS C. P. & P. A.

As briefly announced last week, Mr. A.E. Cadman has been appointed assistant secretary of the Canadian Pulp and Paper Association, and since the 1st of March has been engaged in the statistical work which will be his particular activity at 701 Drummond Bldg, Montreal .

Mr. Dawe, during four years of the time he was secretary to the association, had the assistance of Mr. Beck to look after the matter of publicity and himself largely supervised the compiling of statistics. Since the resignation of Mr. Dawe last fall, Mr. Beck has been carrying on the work of the office alone while new plans for the work of the association have been in process of formulation. The service of the association to members is largely a matter of statistics and the art of presenting figures in such a manner as to make them easily understood and interpreted is a very necessary function of the secretary's office. Mr. Cadman is admirably qualified to do this kind of work. He was educated at St. Marks College and London University and is also a graduate with the degree of B.A. from Queen's University. Four years ago he joined the Canadian Export Paper Co., to form the statistical department which he carried on very efficiently. Mr. Cadman is a fellow of the Royal Statistical Society of London and a member of the American Statistical Association. He has contributed a number of interesting articles to the London Times, the New York Sun, Financial Post, the Pulp and Paper Magazine, etc. It is not exaggerating matters to say that Mr. Cadman's work will figure largely in the contribution of the Pulp and Paper Association to the Canadian Industry.

MR. CADMAN.

UNITED STATES NOTES

At a board meeting last week directors of the American Writing Paper Company were re-elected. The company's annual report will be published in a few weeks and it is estimated that it will show a loss after charges of approximately $1,500,000. This will include inventory write-down of nearly $1,000,000, it is said.

The Bureau of Standards at Washington has secured the services of S. W. Wilson of the Graham Paper Company of St. Louis as technical advisor for the work being done by the bureau on the standardization and simplification of paper and paper products. Mr. Wilson was chief of the Pulp and Paper Division of the War Industries Board during the war.

A notice has been issued to creditors of the Hercules Paper Corporation urging them to organize for the preservation of their rights and the protection of their interests. The corporation and its subsidiaries, the Frank Gilbert Paper Company and Union Waxed and Parchment Paper Company went over into receivership recently on a creditors' petition, as was reported in the Pulp and Paper Magazine of February 23rd.

Returning last week from an extended trip through Northern Europe and England, Orvar Hylin, president of the Lagerloef Trading Company, Inc., New York, and representative in the United States for the Finnish Cellulose Association and Finnish Wood Pulp Union, gave out a statement summarizing conditions in the Finnish Wood Pulp Union, gave out a statement summarizing conditions in the Finnish Paper industry and touching on the general European business and industrial situation as well. Finnish pulp mills, declared Mr. Hylin, ran through the depression period operating at capacity, in which respect the industry did far better than most other countries, none of which even approached capacity production. In paper lines, Mr. Hylin found that business was fair and, although profits were small, the industry was able to show a good result at the end of the year. Finland, he pointed out, is now practically self-supporting, is getting her balance of trade where it should be, and is almost living within her own resources, which is true of but two other European countries at the present time—Great Britain and Czecho-Slovakia. General conditions in Sweden were found by Mr. Hylin to be less satisfactory, with no immediate prospect for a radical betterment, but industry in England and France, he said, is starting to retrieve its lost ground. Plants are busier and demand is picking up.

T. T. Webster, representing the Pulp and Paper Traffic League, appeared before the Interstate Commerce Commission's rate hearing last week and argued in favor of railroad rate cuts on newsprint. He stated that he represented 208 paper mill operators, and in their behalf he petitioned for the removal of all increases given the railroads in 1920. By thus reducing rates, he asserted, the commission would force the carriers to make reductions in their operating expenses which would correspond to reductions made by managements of other industries. A. H. Campbell, representing the International Paper Company, said that a particular discrimination had been entailed against Eastern mills in the paper industry by post-war rate increases. He estimated that increases on paper affecting the International company has amounted to 138 per cent., and that the increase on paper from certain Western producing points during the same period amounted to 62 per cent.

V. D. Simon of Chicago is conducting experiments for the Tomahawk Paper Company in the Wisconsin Valley in an effort to perfect a de-inking process. He is trying to work out a method of removing ink from old paper so it can be used with pulp in the manufacture of new paper. The Tomahawk mill may resume operations again on the first of April, following a shut down of several months.

While there have been indications recently of improvement in the general situation, paper manufacturers in the Fox River Valley, Wisconsin see the necessity for making wage re-adjustments. Most of the mills have been operating at a loss, and only a few show even small profits. It is the opinion among leading paper makers in the Valley that since prices of paper products must be brought down to meet competition, labor costs must also be revised downward, otherwise numerous establishments would be compelled to shut down.

A campaign to educate the retailer in the value of buying from the jobber, worked out some time ago by the Wholesale Stationers' Association of the United States, was formally and solidly launched at the closing day of the association's convention in New York City. The jobbers promised to show the retailer by personal contact, wherever possible, by advertising in the retail and jobber trade magazines and by distributing pamphlets in their mail, how the scientific retail buyer will find it most to his advantage to order his supplies from the scientific paper jobber.

Discussing the relation of the forestry problem to the paper industry before the Yale Forest club last month, R. S. Kellogg, secretary of the Newsprint Service Bureau, declared that hard times have had little effect upon the consumption of newsprint paper in the United States. "The total consumption of newsprint paper last year," said Mr. Kellogg, was 1,900,000 tons, or only 41,000 tons less than that of 1920, the greatest year ever known, and 52,000 tons more than in 1919, second only to 1920 in consumption. The newspaper publisher and the paper manufacturer are alike concerned in the forestry problem and are working together to maintain our timber supply through adequate legislation to prevent fires, extend the area of publicly owned forests, encourage reforestation by private owners and set up conditions under which all land chiefly valuable for such purposes can be made continuously productive of timber crops."

Horace P. Griffith & Co., Certified Public Accountants of Philadelphia, have added to their staff John Balch one of the best known cost accountants in the paper industry. Mr. Balch was for a number of years Cost Accountant for the Chemical Paper Manufacturing Company of Holyoke, Mass., and was the first secretary of the Connecticut Valley branch of the Cost Association of the Paper Industry. The general cost accounting and installation work of Horace P. Griffith & Co. will be handled by Mr. Balch under direct supervision of the members of the firm.

Mr. H. J. Williams, manager of the export department, Harrisons and Crosfield, Limited, Montreal, is leaving for business trip to England.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, March 7. Reports from practically all actions of the paper trade are to the effect that business is improving – that the industry is in fact, getting down to a basis of confidence. The old feeling of uncertainty, particularly as to the course of prices, is gradually disappearing, and jobbers and manufacturers are acting with a stronger belief in the immediate future as it touches the industry. In our foreign business, competition is still very keen, and trade is being done on a margin which leaves only a small profit — in some instances, exporters are lucky to break even.

With regard to newsprint, Mr. G. Chahoon, jr., of the Laurentide Co., and Mr. P. B. Wilson, managing director of the Spanish River Pulp and Paper Mills, Ltd., have spoken optimistically. Mr. Wilson, who spent a few days last week in Montreal, stated that his company's mills are working at capacity, and recently made a record in the number of tons put out in any one day. The total was 667 tons for the three mills. Mr. Wilson sees nothing in the immediate future to justify the slightest apprehension as to the industry and certainly does not look for any lower prices for newsprint. These utterances, coupled with the news that the outlook for foreign trade is improving, confirm the general idea that this section is now on a much more satisfactory footing.

Other branches are also picking up. Book papers continue in demand, and orders for fine papers are on the upgrade; Kraft is also a little better. A hand to mouth business is being done in roofing felts; rags are scarce, and waste paper is in fair supply.

The pulp market continues to show inactivity. The long looked for revival has not yet materialised although orders are a little more numerous. The number of telegraph orders for some grades of pulp and the anxiety of the customer in training delivery indicates an apparently total absence of stocks of raw material. General business, according to all reports has made definite progress in the hill climbing demonstration now going on in all lines. More business and more manufacturing mean more paper at every stage. Each step in the improvement of the general situation must be immediately reflected from merchant to jobbers, to paper mill and to pulp mill.

One of the most prominent men in the paint industry reports a very satisfactory and constantly increasing volume of business in his line and finds the general situation in retail hardware definitely on the upgrade. All of which is a hopeful indication.

The Trade Outlook in Toronto.

If one thing stands out, in discussing market conditions here, it it that business is bound to grow in volume. Sales in all lines still reflect very close buying, while there is every reason to believe stocks are not large.

One very satisfying feature is the increased volume of sales in kraft wrappings, the first few weeks of this year showing better business than the first five weeks of last year. There has been a steady growth in this business since last midsummer. This is gratifying as reflecting steadily improving conditions in all retail selling trades. Bag men find however, that retailers are buying very closely on almost a week to week basis, which reflects marked influence on the overhead costs, especially the placing of local orders.

Sulphite, on this market at least, still maintains rather a wide range of prices, indicating somewhat the anxiety of some mills to keep up production in the face of a slow buying market. Productions are at rates of from fifty to eighty percent. of capacity and prices are quoted between $60.00 and $70.00 for the lower grades. Kraft has a fair market at $70.00 and mills are reported as doing up to eighty-five percent. of capacity.

Bleached sulphite keeps in the neighborhood of $100, though large orders might secure some concessions.

Fresh ground wood runs from $35.00 to $40.00 delivered.

Kraft wrappings are steady at $8.75 per hundred.

Bristols, Covers and Tags are quiter than for some weeks past but there are no recessions in price.

Tissues, Toilets and Towels have experienced in the first two months of this year a much greater volume of business than in the same period of 1921. The present market is quiet but steady, and jobbers report a fair volume of orders but all in small quantities.

NEW YORK MARKETS.

New York, March 4. — (Special Correspondence)—Trade activity in paper in the New York market continues to be principally of routine character. There is a fairly consistent demand for small lots of most kinds of paper, and, if anything, there is a gradual increase in business though the market is broadening very slowly. Reports from mill centres are not of the most encouraging nature. A majority of paper manufacturers are failing to get sufficient orders for their product to keep their plants busily engaged, and while here and there a mill is reported operating at capacity, these are the exceptions rather than the rule.

There are many in the paper trade who express the opinion that one of the leading reasons why the paper industry is at present attended by such a degree of quietness is that the United States' export trade in paper has fallen to such a low level. These authorities are of the belief that the secret of renewed prosperity for the American paper manufacturer lies in increasing our export business. How this can be done at present is somewhat problematical, as all readily admit. Conditions in foreign countries are bad, probably a good deal more so than they are in this country, and consumers abroad are buying paper along with various other manufactured products in very limited fashion. Moreover, financial conditions are such in most foreign countries that producers in the United States are generally disinclined to take chances in selling in the markets abroad.

There is no gainsaying that this country's export business in paper has dwindled in the last year or so. Just for illustration, the latest Government figures show that exports of wrapping paper from the United States during the full year of 1921 amounted in value to only $2,293,900, compared with about $7,000,000 in the preceding twelve months, while exports of tissue paper last year totaled but $906,411, against $2,654,530 in 1920. Doubtless the decline in paper prices accounted for a good deal of this drop in export figures but it is also a

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certainty that the tonnage also decreased to a marked extent.

The Federal Trade Commission's review of the paper industry for January contains figures relative to production, shipments, etc., which are rather encouraging. The report shows that a total of 506,195 net tons of paper and paper board of all kinds was produced in January, contrasted with 508,284 tons in December, 1921; 420,468 tons in January, a year ago, and an average monthly output by American mills based on reports covering the past five years of 504,175 tons. Production in January therefore was better than the average, and was only a trifle below that of the preceding month. Mill shipments of paper in January amounted to 494,868 net tons of all grades, while stocks at the end of January totalled 264,971 net tons, compared with 253,644 tons at the beginning of the month, showing a slight increase in mill stocks for the month.

Reports generally tell of a moderately good demand for newsprint. Publishers are absorbing print paper in good tonnage, everything considered, and mills are finding it necessary to increase their production to take care of customers' wants. A statement issued this week shows that the International Paper Company has worked its daily output up to a good level, and that shipments hold up close to the current production. Market prices on newsprint rule steady, and sentiment in the trade is common that there is small likelihood of any further decline during the present year; in fact, there are those who express the opinion that print paper prices will rise before the year is out.

Book papers are in about the same position previously reported though indications are more favorable and it would appear as if demand for this kind of paper is due for expansion. Activity in the printing and publishing trades is on the increase, and paper jobbers report a great many more inquiries concerning book papers and a larger number of orders for small lots. Prices are still rather unstable. Competition among manufacturers for business makes for unsteadiness in quotations, and a good grade of machine finished book paper is readily to be had at 5.75 to 6 cents a pound f.o.b. New York, it is reported by paper merchants in this city. Super book is quoted by mills at around 6.25 cents a pound, while coated book is quoted at from 8 cents upward, depending on the quality and amount involved.

Wrapping and tissue papers also are somewhat unsettled in price and are in limited demand. With spring and the pre-Eastern shopping season approaching, the trade is looking for improvement in these papers, but thus far buying is almost entirely of hand-to-mouth character. Fine papers are in slow demand with consumers centering their buying on the lower qualities of bonds and ledgers. Quotations, however, are maintained, and manufacturers contend there can be no further changes of note until raw materials come down in cost. Box boards are in better call and the market is taking on a livelier atmosphere every day. Prices on plain chip board are steady at about $37.50 a ton f.o.b. New York, and on filled news board at $40 to $42.50 per ton.

GROUND WOOD. Demand for mechanical wood pulp is of limited scope, consumers coming into sight as buyers only when in immediate need of supplies and even then being indisposed to order other than tonnage sufficient to last them for a brief period. Most reports are to the effect that there is much room for improvement in the market, and dealers say that were it not for the contract, business going through, the trade would be characterized by scant activity. As far as has been ascertained, quotations are fairly well maintained. There is a certain amount of easiness apparent but producers are generally naming the same prices as heretofore, which range around an average of $31 to $32 a ton f.o.b. grinding plants for domestic spruce ground wood for prompt shipment. Little mechanical pulp is coming into the States from European sources, it is said, owing to the high prices asked by Scandinavian manufacturers. Importers claim they must obtain from $36 to $38 a ton ex-dock New York for Scandinavian ground wood in order to realize a profit on importations.

CHEMICAL PULP — Current business in chemical wood pulp is far from brisk. The market as a whole is quiet with demand spasmodic in character and at best involving a light total tonnage of pulp. Sulphite appears to be holding comparatively steady in price and evidently is in relatively better call than other pulps, while kraft shows a weakening tendency and soda pulp exhibits an easy tone. Most sales of kraft pulp at present are around a price basis of 2.75 cents a pound, while some lots of Scandinavian kraft are being marketed at less than this figure. Soda pulp is quoted by sellers at 4 cents a pound but it is asserted that purchases can be made at cheaper prices. No change of importance is noted in sulphite quotations.

The Federal Trade Commission's review of the pulp industry for January shows that a total of 157,746 net tons of chemical pulp was produced in the United States in that month, compared with 151,031 tons in December, and an average monthly output based on reports covering the last five years of 155,700 tons, indicating that pulp manufacturing in the States is on about a normal scale. Mill stocks of chemical pulp increased slightly during January from 46,843 tons at the beginning of that month to 50,815 tons at the end of January.

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RAGS.—Trade in papermaking rags has slowed down to a marked extent during the past few days. Even roofing stock, which for a time was in excellent demand, is wanted in smaller lots by mills and prices have eased off some several dollars per ton.

PAPER STOCK. — Most grades of waste paper hold moderately firm in price. There are one or two descriptions that are in a slightly easier quotable position, but the market generally is characterized by much steadiness and dealers are not hesitant to turn down orders which fail to come up to their ideas of value. Low grades are especially steady.

OLD ROPE AND BAGGING. — Old manila rope is again lower in price, reports telling of sales to apper mills at 4.25 cents a pound at dealers shipping points for No. 1 rope. Mixed strings, on the other hand, are steady at 90 to 95 cents a hundred pounds f.o.b. New York. Old bagging is moving in fair quantity at prices ranging around 95 cents a hundred pounds for No. 1 scrap and 80 cents for roofing bagging.

HIGH LIGHTS ON THE NEWS PRINT SITUATION.

(From News Print Service Bureau, New York.)

The fact that news print paper is a commodity of remarkably steady consumption in the United States — perhaps even more so than sugar and salt—is once more evident from the latest statistics on the subject.

It is but repeating what is now a well known statement to say that the consumption of standard news print paper — and this is 93 per cent of the total output of news print — increased only 5 per cent in 1920 over 1919, when a new high record was hung up, but it is not so generally realized that the consumption in 1921 — a year of general business depression — was but 2 per cent below that of the boom year 1920 and actually 3 per cent more than in 1919.

Economists and statisticians have long known that in a freely competitive market, 5 per cent under or over supply of a commodity will bull or bear the price, and this principle was strikingly illustrated in the news print trade of these two years. In 1920, the small increase in total consumption lead to a fear of shortage on the part of many publishers and the price on the open market was bid up to previously unheard of levels — yet when the year closed, and there was opportunity calmly to cast up accounts, it was found that production had increased 10 per cent over the previous year, that consumption was 5 per cent more than in 1919, and that newspaper publishers had finished 1920 with 50 per cent more paper on hand and in transit than they had at the first of the year! So much for illustration No. 1.

In 1921 we got illustration No. 2. Consumption decreased but 2 per cent from the high point reached the previous year, everybody talked about over-supply and held off from buying, the open market price came down precipitately, and publishers finished with 17 per cent less paper on hand and in transit than they started in with.

The failure to understand and act upon known figures and discernible tendencies cost producers and users most dearly. The publishers paid inflated prices for tonnage beyond their contracts which were reflected through corresponding rises in the constituent raw materials; the manufacturers made large additions to productive capacity at the time of highest construction costs and these new machines were ready to run when the greatest need for them had passed. An already bad situation was aggravated by the continual offering and delivery in our markets of overseas paper at prices which in some cases went far below the American cost of production.

So much for 1920 and 1921. What of 1922?

The high lights available at this time indicate that the pendulum is on the return swing — that consumption of standard news print in the United States this year will be more than last year and probably equal the total reached in 1920. The man who prophesies is likely to go wrong, but the facts at this writing (Feb. 21), are:

Newspaper circulation is greater than ever before in history.

For the last 12 months the larger papers have averaged more pages per issue than during the preceding 12 months.

Newspaper advertising in the larger papers (and they consume over 90 per cent of the total) fell off relatively little in 1921 and the curves which went sharply downward in November, December, January 1919 and 1920 have held almost level during the past 3 months.

Stocks in the hands of manufacturers are only normal, and in the hands of publishers less than normal.

A low price on the American product and an increase of domestic consumption in Europe will gradually reduce the overseas importations.

The general business situation in America is unquestionably on the mend, the period of liquidation has largely run its course.

With lower operating costs attained or in sight and a better demand for the domestic product, the news print manufacturer should fare better in 1922 than he did in 1921.

R. S. KELLOGG,
Secretary.

TRADE IMPROVEMENT UNDER WAY.

The various trade indices of statistical organizations reflect much greater trade activity recently than in the summer months. Trade journals also report good retail business, chiefly in staple rather than luxury lines (a thoroughly healthy sign) and in quarters where the lower cost level has been properly recognized in retail prices. House-building has been exceptionally active in Canada since August, with strong indications of renewed activity next Spring, and with a real shortage of houses still to be made good. The Canadian textile, woollen and shoe industries have met shrinking inventories and lower selling prices courageously, and are operating at a good percentage of capacity and at a reasonable profit.

Improved railway earnings all over the continent, and declining money rates, forecast the possibility of a great deal of deferred equipment financing by the railways, which will bring back into the commodity market a class of buyers of immense importance who have been almost out of it for several years. The steel business holds its gains in percentage of capacity actually operating. Average steel operations in the United States were 15 per cent. of capacity in July, the worst degree of depression ever recorded by the industry; they have risen to about 40 per cent, and steel men look for 65 per cent by March or April. Iron production, an invaluable barometer of coming metallurgical activity, showed a 17¼ per cent increase for the United States for November over October, and 69 per cent over the low level of July.—Investment Items.

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OF CANADA

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J. NEWELL STEPHENSON, M. S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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:-: EDITORIAL :-:

AMERICAN CAPITAL IN CANADA.

Several months ago the New York Herald printed an editorial which pointed with dismay to the decrease in trade between Canada and the United States and particularly to the more rapid decrease in exports from the United States than in imports from Canada. At that time where Canada's exports decreased $1.00 the United States exports to Canada went down $2.25. It will be interesting to quote from the Herald:

"Canada had become our second biggest and best customer in the whole world. With our Canadian exports of approximately a billion dollars a year, only the United Kingdom surpasses Canada in the volume and value of goods bought by them. The whole of South America, with Mexico, Central America and the West Indies thrown in did not equal Canada as a buyer in the markets of the United States." The Herald continues to say that Americans have plastered loans over all other countries which never can be normal customers while they have been stingy with credits to the one country destined naturally to be their very best customer. The remedy suggested by the Herald is to extend larger loans and a less highly taxed reception to Canadian trade.

From a glance at the geography it is evident that no two countries in the world with a common boundary line carry on such an extensive trade as that which passes across the 49th parallel. It will be difficult to find, likewise, any other two countries that are so nearly alike in personal characteristics, ambitions, and ability as Canadians and Americans. In no two countries are labor conditions more nearly alike or on so high a plane. In few countries is there a closer international ownership and management of industry.

In spite of, or because of the extent which American capital is already invested in Canada and alarmed at the course of our international trade with Americans, the New York Herald seems to take too serious a view of the situation. It must be remembered that during the past few years Canadian industry was on war wages with labor engaged in the production of war materials and that huge sums were expended by manufacturing plants for raw materials and semi-finished products in the United States and individuals were spending lavishly on high priced imported luxuries. This caused an excess of imports into Canada over exports to the United States which did not however, become apparent as a serious situation so long as we were exporting enormous quantities of war materials to Europe. When the war ceased, our exports of munitions immediately ceased but the habit of buying high priced things from across the line was a difficult one to break away from and it continued so long as our people had the money to spend. But of late an awakening has come, both to the fact that we cannot afford many of these luxuries and also to the fact that many of the materials heretofore imported can now be found in Canada of equal quality and value and that by purchasing the domestic product our fellow countrymen are kept more fully employed. It will be seen therefore, that a drop in our imports from the United States was absolutely necessary; we simply cannot go on paying for excess of imports from them over our own exports to the south. The ratio of the decreases is not to be wondered at and it would not be surprising to see our dollar again back to normal as a result of a fairly even balance of trade between the two countries. In fact the time will doubtless come when a much lower tariff barrier to our mutual trade relations will be accomplished on both sides to the great advantage, we think, of both countries.

To come back to the matter of American loans to Canadian industry, we find here a rather puzzling situation. We are a comparatively young country on the verge of industrial development, with enormous natural resources, an intelligent and industrious population, and comparatively little domestic capital to carry on developments which would enable the production for home consumption and for export of many materials for which there is now or shortly will be, a very extensive demand. For the development of these resources, we need also and could accommodate a very much larger population and this of course means more immigration of picked people. As regards the matter of foreign investment in Canada, it has been shown that quite a fair proportion of Canadian securities is held in the United States, these being largely municipal, provincial and industrial paper. Probably more Canadian railroad stock is held in England than in the United States.

The large amount of industrial securities held by our neighbors is due apparently to two major causes: First, the establishment of branch plants in Canada for the manufacturing of goods on which there is a considerable import duty or merely for the more convenient assembling of manufactured parts brought over the line. Second, the establishment of industries in Canada for exploitation of our raw materials such as minerals, forests, and water powers where the United States is deficient in these manufacturing factors or finds them not conveniently available to the principal centres of consumption. There are very few instances of the first class in the manufacture or conversion of pulp and paper in Canada but there are a number of instances where fairly large amounts of American capital have been invested in Canadian mills for the primary conversion of forest and water power into pulp and paper for export. Such investment has worked to the advantage of the American investor and not without disadvantage to the Canadian holder of an interest in such a business. The investment of American capital in a Canadian paper mill naturally acts as a magnet to draw the product to the same market. There are doubtless a number of instances where a person interested in the manufacture of paper is also interested in its consumption. It was to some extent this situation which practically ensured American publications of their necessary requirements of paper under circumstances which recently made it difficult for paper users in other countries to obtain necessary quantities. Another feature of this financial relationship is the large profits to the Canadian plant which exported to the United States during the recent period of high rates of exchange. Of course where interest was paid to the American bond holder there was no such advantage as came to the Canadian who cashed his coupon in Boston or New York. It would be difficult to ascertain what proportion of the dividend distribution of Canadian mills goes across the line. During the past year there have been a good many that did not have much dividends to distribute but in normal times there is a considerable amount going south.

Whether the investment of more American capital in Canadian industries should be vigorously encouraged is quite a problem. Everyone knows Canada's wealth is gradually accumulating to the point where normal developments can be cared for at home, and it may be that for the next few years Canadian financiers and Canadian savings accounts can take care of such expansion as may be required and which may be justified. It is not fair to lay too much stress on the amount of money which must be paid outside the country to holders of Canadian securities because the profits distributed to them are largely derived from sales of our product in that country. Likewise we must not underestimate the benefit to our own Canadian countrymen from the distribution of wages for the construction as well as the operation of the plants which foreign capital has been largely instrumental in establishing. These plants have given employment not only to the constructors and the operators but also to workmen in many other industries furnishing supplies and equipment and their maintenance requires renewals of material and repairs to equipment which continue to employ other plants.

The question now, apparently is whether we have not reached a point in the development of at least certain of our industries where we need not offer any particular inducement to encourage investment of very great amounts of American capital. It was pointed out on the other hand, during the Imperial Press Conference; that Canada might considerably extend her export market for pulp and paper by encouraging further investment of British funds. So it will be seen that the question of foreign investments in our pulp and faper securities, to cite but one industry, requires really an almost world-wide study of market as well as financial conditions.

ENCOURAGING FORESTRY.

We venture to say that during the past year more has been done to a rouse the people of the United States and Canada to the serious situation existing with regard to our forests than has been accomplished in all the years that have preceeded. Magazine articles, newspaper articles, hearings before congressional committees, speeches and legislation in state legislatures and provincial assemblies and addresses at public meetings have all attempted to, and to some extent succeeded in arousing public opinion and public interest in this important problem. Back of all the speeches and published articles, there has been an enormous amount of quiet, persistent thought and discussion in conversation and correspondence among friends of the forest who realize the rapid rate at which our forest lands are being devastated.

One of the most enthusiastic supporters of forest conservation is Mr. F. J. D. Barnjum of Nova Scotia. Mr. Barnjum, who is a native of Montreal, has extensive holdings in the Peninsular Province but his interest in the forest is Dominion wide. His great ambition, to the accomplishment of which he is now devoting practically all of his time and much of his income, is to see Canadian grown timber the perpetual basis of a prosperous and uninterrupted Canadian industry. To this end, as an encouragement to the thoughtful consideration and wider publicity as to the various phases of the problem and in order to get from a great variety of sources, information which may be helpful in the formulation of laws and regulations, Mr. Barnjum has offered a very generous set of prizes which are explained on another page.

The eastern provinces and British Columbia are deeply interested in forest protection and management because of their wood using industries built up on the basis of timber resources. The prairie provinces are interested because their timber is practically all gone and any wastage in other sections of the Dominion means higher prices for their paper products and building materials, while the future of all of Canada depends upon conserving what we have and growing more. Everyone in Canada, therefore, has a stake in the Canadian forest and we trust that many readers of the Pulp and Paper Magazine will take advantage of Mr. Barnjum's offer. The editor will gladly co-operate with the donor of the prizes by publishing the winning essays when the awards have been made.

COBWEBS.

The editor had the pleasure of meeting Sir Frederick Becker last week and found him the genial, optimistic person that one might imagine him to be from looking at his picture. Sir Frederick has a large interest in five or six Canadian pulp mills making both sulphite and mechanical pulp and appreciates the dependence of the pulp mill on the forest. He is a strong advocate of efficient fire protection measures and of careful forest management. We were favored with one of Sir Frederick's famous cigars which are made especially to his order and which was both the finest and largest that we have ever had.

Sir Frederick has not been in Canada for the past two or three years and this is his first visit since his fiftieth birthday and his acquisition of knighthood. His interest in the Canadian industry will undoubtedly increase and we trust that his visits will become more frequent so that Canadians may know him better.

We were glad to read in the Paper Makers' Journal a letter commenting in a friendly and complimentary way on the action of a Canadian paper mill on their action with regard to wages.

Mr. G. C. Piche, chief forester for Quebec has issued an extensive list of trees available from the nursery at Berthierville for forest and ormamental planting.

Did you ever wait for a hen to come off? If you did, you will appreciate the feelings of the Textbook Committee. The third volume of the textbooks covering the *Manufacture of Pulp* is on the press and is due to be off next week. We venture to say there will be some cackling about the time it appears.

Timber Miners or Timber Farmers?

By EDWARD RICHARDS In THE NATION.

The American lumberman is a timber miner. He thinks of his forest as a solid mass of raw material which he is working up for sale. He does not think of, and treat accordingly, the forest as a living, growing, crop-producing resource. His way of thinking is a relic of the early days of this country when everyone spoke of the "inexhaustible" resources of the United States. The result of such thinking is the reckless exploitation of our forests which is almost universally practiced in logging operations. The mature timber is there waiting to be harvested. The most money can be made by going in once, taking everything that can be handled at a profit, and then getting out and going elsewhere, allowing the land to revert to the State for taxes. It will take a life-time for a new forest to grow. Why fuss with such a proposition at all? Clean up and get out. This has been and largely still is the psychology of the American lumberman. Its results as affecting the forests of the country may be summed up in two words—**forest devastation.**

The proper handling of forests on our State and Federal lands is now well established in the public mind and is rapidly becoming a fact in the woods. But forestry on private lands, especially big economic timber tracts in the far South and far West, has not begun. Forest fire-protection has been established in places, but forest fire-protection is not forestry. Fire-protection is necessary but by no means all. Boiled down, the work of the forester is just one thing, i. e., the continuous production of forest crops. On this basis forestry has not begun to be practiced on privately owned, large-sized, economic timber tracts in the United States, with the exception of a few paper companies in the Northeastern States, whose supply of raw material has been nearly exhausted and whose very existence necessitates a perpetuation of their forests.

Meanwhile our timber situation grows worse and worse. Three-fifths of all our virgin timber is already gone and we are cutting the remainder four times as fast as it is growing. The center of our production of lumber has migrated from New England to New York, thence to Pennsylvania, moved in turn to the Lake States and the South, until now after less than 100 years our country has to look to the Pacific Coast for the bulk of its wood supplies for the future. The shipments of Western timber to the East are increasing all the time. Today Western lumber is sent by ship down the Pacific Coast, through the Panama Canal, up through the Gulf of Mexico and the Atlantic to New York. There it is unloaded on the docks, reloaded to freight cars, and hauled all the way to Chicago and other Middle Western points. Such a long and costly haul for the delivery of lumber is absurd when it is remembered that good pine lumber can be grown in Michigan and in the other Lake States on land millions of acres of which are today idle waste. Out of an original area of forest of 822 million acres only 137 million are left in virgin stands. Over 300 million acres of this cut-over land is unsuitable for farming and yet is not producing good timber for a second cut owing to the reckless methods of cutting used, the lack of seed trees of good species allowed to remain, and the damage from over-grazing, fire, and neglect. Eighty-one million acres, in addition to the above 300 million, is so badly damaged that it is a desert of briars, rocks, stumps, and scattered bushes. This huge area of eighty-one million acres of desert is as large as the combined total forest areas of France, Holland, Germany, Belgium, Switzerland, Portugal, Spain, and Denmark, and is being increased by continued reckless logging at the rate of three million acres per year.

The people of the United States use about 300 board feet of lumber per capita per year. This is two or three times as much as that used by the people of Europe, and it is much more than we ourselves will have to get along with them the shortage of wood becomes acute. For let it be understood once for all, the United States is going to have a timber shortage in about twenty-five years. This is inevitable because for the past fifty years we have been destroying our forests and none have been planted to replace them. As it takes over fifty years to grow saw-timber, and as none was planted fifty years ago, when our remaining virgin forests are all gone, which will be in from twenty five to fifty years, there will be nothing to cut in the way of new growth. A shortage of lumber, therefore, is inevitable.

"But," the incredulous reader replies, "we can get our lumber from Canada or from Europe or the tropies." Unfortunately this is not a solution. If we cut and imported every stick of timber growing in Canada, at our present rate of consumption we would use it all up in twenty years. Mexico already imports lumber for her own needs. So does most of Europe, Russia alone having enough to export some to other countries. The tropical forests are made up largely of species with very heavy, very hard wood, while the bulk of our uses for lumber call for soft woods, pine, fir, and the like.

One often hears that the substitutes for wood the replacing it so rapidly that ultimately little or no wood will be used. But this fails to consider the fact that new uses for wood are being discovered more rapidly than are substitutes for it. Altogether the cold facts of the case inevitably point in one direction, and one only. America is facing a severe shortage of wood, and it can get wood only by growing it itself.

The first step in getting the United States seriously started on the road toward real forestry practice is to stop the further devastation of our remaining forests. For, by seeing that the logging now going on in the virgin forests which remain is so regulated that a young forest is established as fast as the mature trees are cut, our huge area of waste land will at least not be increased. Next to this comes the protection of forests from fire. Today this is only one-third accomplished, taking the country as a whole. Third comes the gigantic task of reforesting the cut-over and waste lands. For the lumberman seriously to practice forestry a new point of view is needed. He must become a timber farmer instead of remaining what he is now—a timber miner.

PRIZES TO RESCUE FORESTS.

The critical condition of Canadian timber owing to enormous ravages of the bud-worm and to forest fires, is such that prizes are being offered, open to every Canadian citizen, for its preservation. Frank J. D. Barnjum, prominent timber magnate, of Annapolis Royal, N. S., is offering them and expresses the hope that for this worthy object public-spirited citizens or Provincial governments will duplicate them.

Prizes totaling $1,000 are open to any Canadian citizen, divided as follows: $500 first prize, $250 second prize, $150 third prize and $100 fourth prize, for the best essay on the regulation of the forest fire menace, with suggestions for the enactment of laws for their prevention, or for any other methods for the protection and retention of our forests for our home industries. Judges to be the two Provincial Foresters of Quebec and New Brunswick the Dean of the Faculty of Forestry of the University of Toronto, and the Director of the Dominion Forestry Branch. Essays to be mailed to Mr. Barnjum's address on or before June 1, 1922; prizes to be awarded and paid July 15, 1922.

In Quebec Province $250 in cash will be given for the best municipal plantation planting to be done this spring. Prize to be awarded September 15th, 1922. Judges to be the Minister of Lands and Forests of Quebec, the Director of the School of Forestry, Laval University, Quebec, and the Chief Forester of Quebec.

A prize of $250 in cash to the Chief or District Fire Ranger whose district shows the most efficient organization and best results and showing proportionately the least fire loss as determined by his activity in fire fighting, and by the application of the best preventative methods. The judge to be the Chief Forester of Quebec, and prize to be awarded and paid on November 30, 1922.

Similar prizes are offered by Mr. Barnjum for the Provinces of Nova Scotia and New Brunswick. The dates are the same as for Quebec, but the judges are the appropriate local Ministers and other forestry authorities.

The cash bonus of $2 an acre to Nova Scotia farmers for every acre of spruce or pine seedlings planted on their farms this spring, already mentioned in the press, still stands good, and many farmers are taking part.

"There has been so much fruitless discussion of this vital subject," ended Mr. Barnjum, "that the urgency of the situation moves me to make these offers. As many may want to enter and who are not familiar with this particular subject, I will mail further information to them free on application."

LINCOLN PAPER MILLS ENTER BOOK AND WRITING FIELD.

This well-known company has established a strong reputation in several lines, espcially strong bagging and wrappings of sulphite and rope stock, glassine and greaseproof papers. They are now entering a wider field and will put on the market several lines of book, envolope bond and related grades.

To handle this work they have secured the services of Mr. G. C. Winlow, who has had nearly twenty-five years' experience in handling these lines. Mr. Winlow is a Torontonian and received his education at the Jarvis Street Collegiate school in that city. He has been with the Canada Paper Company from the time he left school to the present, and therefore brings a wealth of experience in the sale of paper.

MR. G. C. WINLOW.

Mr. Winlow has behind him a mill in condition to turn out large quantities of high-grade stock and which is fortunate in having as General Manager Mr. K. S. MacLachlan, a man of scientific training who was not afraid to learn his paper-making at first hand by the overall route.

PROCEEDINGS OF THE TECHNICAL SECTION.

REPORT OF THE ANNUAL MEETING.

(Continued from last issue).

Financial Report of the Secretary.

MR. CARRUTHERS: We shall now pass on to the financial report of the Secretary.

MR. BECK: Mr. Chairman and Gentlemen, as you are probably all aware, I succeded to Mr. Dawe's duties as Secretary only very recently, and this financial statement really represents the work of Mr. Dawe during the year as I had practically nothing to do with it. According to the statement we started the year with a balance of $739.99. We raised during the year as dues $1,511.34, and were credited with bank interest to the amount of $19.25, making a total of $2,270.58, of which $1,768.69 has been expended. This leaves a balance in the bank of $501.89 as against a balance of $739.99 a year ago.

Annual Statement—Technical Section, C. P. & P. A. year 1921.

Dr.		Cr.
1922		
Jan. 2	Stenographer's salary	$ 325.00
	Entertainment	150.00
	Association dues	85.00
	Charges on cheques	12.72
	Prizes	175.00
	Subscriptions to Magazine	498.00
	Travelling	124.57
	Summer meeting	372.40
	Office furniture	26.00
		$1,768.69
Jan. 2	Balance in Bank	501.89
		$2,270.58
1921		
Feb. 1.	Balance in Bank	$ 739.99
	Dues paid during 1921	1,511.34
1922		
Jan. 2	Bank interest	19.25
		$2,270.58

On motion of Mr. Anderson, seconded by Mr. Mason, the report was adopted.

On motion of Mr. Stephenson seconded by Mr. Wardle, Mr. Beck was authorized to sign cheques in place of Mr. Dawe who has retired from the secretaryship.

Presentation of Prizes for Essays.

At this stage three young men were invited to come forward to receive the prizes which had been awarded by the Section for the best essays on the subject of pulp and paper. The prizes were awarded as follows:

First, William Cauldwell Munro, 251 Wilson Ave., Notre-Dame de Grace, Que.

Second, Douglas E. Read, 37 St. Famille Street, Montreal.

Third, F. W. Bradshaw, 823 University Street, Montreal.

The prizes were presented by Mr. Carruthers who said:

It gives me great pleasure to present you with these cheques in recognition of the excellence of the papers which you have written. I congratulate you upon your success and I hope you will find it desirable to stay in the paper industry. Are you all in the paper industry now?

MR. READ: Yes.

MR. CARRUTHERS: Well, you are in a good industry. I wish you success.

MR. WARDLE: Mr. Chairman, the fact that these young gentlemen have gained prizes does not make them professionals, does it? (Laughter.)

Moisting Testing.

MR. CROSSLEY: There is one small item that might be brought up in connection with the reports of committees. Mr. Slack, Chairman of the Committee on Moisture Testing, is not able to be here and he asked me to bring up this point.

There is some question as to the meaning of agreement "within 1 per cent" in cases of joint test.

1. Is it within 1 per cent of the billed test?
2. Is it within 1 per cent of the net weight as billed?

If a car of pulp were billed at 80 per cent and the joint test at receiver's mill gave 79 per cent the position of question 1, would exist. This would mean that in spite of shrinkage in transit, the pulp is found 1 per cent wetter at receiving mill. As this shrinkage in some cases would amount to two percent or more a pulp tested correctly at shipping point as 80 per cent should then give 82 per cent or more at receiving mill.

A finding of 79 per cent on the joint test would mean a difference of three per cent on the net weight.

It is the opinion of the speaker that the agreement should be referred to net weight and not to figure of air dry percentage.

If pulp is billed at 79 per cent at the mill, it would not be fair to say that the joint test was coming out within one per cent if it was found 78 per cent at the receiving mill on account of the shrinkage in transit. In the agreements it should be stated that if the joint test comes within one per cent of the pulp as billed the complainant should pay the expenses. The point at issue is as to who shall pay the expense. It should be settled so that the result should come "within one per cent of the net weight" and not within one per cent of the figure of the air dry percentage.

Report of the Committee on Chemical and Physical Standards.

MR. CARRUTHERS: Mr. Hovey, we will ask you for the report of the Committee on Chemical and Physical Standards.

MR. REX W. HOVEY: Chairman of the Committee on Chemical and Physical Standards: Unforunately, our train was seventeen hours late this morning, so that the report of the Committee on Chemical and Physical Standards is not in shape for turning in to the Exective. There has been a considerable amount of work done in regard to the strength-testing of pulp. The subject has been investigated from several angles and a lot of important data has been compiled. This report will soon be in shape for publication. I will not enter into a discussion of it this morning.

Discussion of Papers

The Use of Clean Water as a Preservative for Storing Mechanical Pulp.

MR. CARRUTHERS: We will now have a paper on **The Use of Clean Water as a Preservative for Storing**

mechanical pulp" prepared by Messrs. R. J. Blair, pathologist, and E. Parke Cameron associate chemist, Forest Products Laboratory, McGill University, Montreal.

MR. BLAIR: I do not propose to take up very much of your time. I had intended to have some samples of my pulp here to pass around. As I had not intended to give the paper until tomorrow, I did not bring the pulp with me, but if you care to listen to a few remarks, I will make them now.

MR. CARRUTHERS: We want to make the most of our time and, if it is agreeable to you, you might go ahead and bring your samples later.

MR. BLAIR: I will arrange to bring the samples this afternoon. During the past couple of years there has been a great deal of talk about protecting pulpwood from decay by keeping the wood stored in such a moist condition that the wood-destroying fungus gets no opportunity to grow and cause decay. It has seemed that the same idea might be applied in the storage of groundwood pulp. It is recognized that wood immersed in water will remain indefinitely in a sound state and it has been assumed that if you take sound wood, grind it up into mechanical pulp and store it in water, it will remain in as sound condition as if it had been left in its original form. Piling which is used in the construction of wharves is below water level where it is constantly wet and sticks of wood which get into the bottom of a body of water remain in a sound condition. Logs which sink while being driven can be recovered subsequently and utilised for various purposes.

I thought there might be something behind the idea of the water storage of pulp, and last year I had a number of tanks made at the Forest Products Laboratory for the purpose of carrying on some experiments. I obtained samples of groundwood pulp from a number of mills and these samples were stored away in the tanks and left for seventeen months until we made tests with this material. The pulp was used in three different forms, some pressed, some freshly made lap, and some slush. The tanks were three feet by two and a half feet by twenty inches deep. These tanks were so equipped that water could be run into them all the time. There was an overflow so that the tanks should not run over and if one wished to change the water quickly it was possible to let all of the water run out. The tanks could be filled again in a short time. The water was changed to see what the effect would be with regard to leaching out starches, sugars and such soluble materials in the wood. In some of the tanks the water was allowed to run in constantly, in some it was changed once a day and in some it was changed once a week. After this condition had continued for seventeen months samples were taken and tested along various lines. Mr. Cameron, who is in charge of the pulp and paper work at the laboratories conducted these tests, and is prepared to describe that part of the experiment.

MR. CAMERON: Mr. Chairman and Gentlemen, the tests made of the pulp were for freeness, bursting strength and tensile strength. Samples were taken as representative of each tank and brought to a consistency of 0.5 per cent. As to the freeness determination, a sample was transferred to the freeness tester and the stock allowed to drain and afterwards poured into the sheet machine. The sheets were very weak as they were pure groundwood, so that they were allowed to become air-dry. They were then tested for bursting strength. Five bursting tests per sheet were made giving an average of twenty-five bursts per tank. That roughly describes the method of the tests. The result shows that freeness is increased in stock stored in slush form. The bursting strength in all cases was slightly decreased. The deterioration was very slight. The idea behind this form of storage is quite sound. Mr. Blair has said that there was no deterioration in so far as fungus growth is concerned. The only change was that in freeness. I do not think that is large enough to show any effect on the product.

The paper of Messrs. Blair and Cameron was printed in the Pulp and Paper Magazine for Jan. 26, 1922.

MR. CARRUTHERS: Do I understand you got about the same results from three different methods?

MR. CAMERON: Yes, very closely; there was some change but not very much.

MR. MASON: Do I understand that pulp was kept for seventeen months without any deterioration? What kind of wood was it made of?

MR. BLAIR: Some of the pulp was supplied by the Laurentide Company. I would like to take this opportunity of thanking also the Belgian Industrial Company, the Donnacona Pulp and Paper Company, Price Brothers & Company, and the McLaren Company for supplying the pulp which we used in these experiments. In some cases we wrote back to the mills a few weeks ago that we were testing the material, and they sent on some fresh pulp to compare with the pulp which had been stored. We have tested quite a number of different lots of pulp—about fifteen altogether—and we have quite an interesting series of tests and, as far as I can remember, some of the lap groundwood which was immersed for seventeen months gives a difference of only about five points.

MR. CAMERON: Except in the slush form.

MR. BLAIR: There seems to be more difference in the different lots of freshly made pulp than in some of the lots of storage pulp. That is rather a peculiar thing but we obtained these results in carrying out tests under the same conditions.

MR. HOVEY: Are you satisfied with the results?

MR. CAMERON: In the light of further investigation, having regard to the strength-testing, I am not altogether satisfied. The tests were all carried out under exactly similar conditions, however, and are therefore directly comparable which is, I think, the important point.

MR. BLAIR: When we obtained this pulp, all that we received was not put in the storage tanks there were laps and sheets left over and they were piled away in the same room as that in which the tanks were placed. This pulp that was left out in the air is in a very disreputable condition. Some of it is so rotten that there is no fibre left in it and some of it is badly molded.

When I bring down my samples of the pulp that have been stored, I will also bring down some samples of the other material and you will see the difference between the two lots of pulp stored in the same building. (The difference was very noticeable.—Ed.)

MR. WARDLE: Have you formed any idea as to an arrangement by which you could have a shallow tank capable of taking care of several thousand tons in which the pulp would be spread out and in which the water would circulate freely?

MR. BLAIR: I could not give you much of an opinion of that but I would suggest that the pulp be stored in such a way that there would be as little surface to the mass as possible. It should be a bulky mass rather than a shallow mass because there is a certain amount of sediment which will be washed in by the water, this settles on the surface of the pulp and the more surface you have exposed to the water the more pulp you will have discolored and darkened. A kind of slime forms but it is only on the surface of the material. It would be an advantage for a person to have some sort of a tank for the storage of pulp that would be divided into sections so that the pulp could be used piece by piece without disturbing the remaining part of it. Some people who have discussed the matter with me claim that it might be feasible to make a dam across a ravine, put a concrete flooring in the ravine and make a tank in that way. That would be about the simplest form of tank that you could make, but it would be absolutely essential to have some roofing or covering for the storage place so that dirt would be kept out, because dirt might get in from the air, and, if clean water is used, there is no reason why the pulp should be dirty. Otherwise, there is no way of keeping it clean.

MR. HERBERT J. C. CHAPMAN: Was there any arrangement in connection with your expriment whereby the water was allowed to become stagnant?

MR. BLAIR: In no case was the water allowed to remain unchanged for more than a week at a time. We usually planned to change the water on Monday.

MR. STEPHENSON: Have you made any estimate of the amount of fibre loss in changing the water?

MR. BLAIR: No sir; but in the case of some tanks where four or five laps were left, these were covered with slime which prevented the washing away of the fibre and they retain the original form; I am quite sure there has been very little fibre washed away.

MR. CHAPMAN: Is there much chance of the fibre breaking off in taking these laps out? Would you not have to use a mechanical method to handle large quantities?

MR. BLAIR: I imagine that if such a process of storage were adopted some labor-saving could be effected in handling the pulp. If it could be taken in some simple form and put into one of the storage spaces, it might be dredged out, or pumped out; so that I am quite sure that a great deal of labor could be saved.

MR. MASON: How would it be feasible to change the water as often as necessary if you wished to store slush pulp for any length of time?

MR. BLAIR: I had one tank with slush in it. This slimy mass came over the surface of the slush and the water was flowing in a very slow stream all the time.

MR. MASON: Then it is continuous?

MR. BLAIR: Yes, in some cases it has been. In this case the pulp was really less disturbed than in cases where the water was actually changed.

MR. BEIQUE: Do I understand that only the surface water is being changed or the water all through the mass of the pulp?

MR. BLAIR: In most cases the plug is pulled out of the tank and the water is allowed to drain out of the tank and the water is allowed to drain out of the tank. As soon as all the free water is out, the plug is put in and the tank is filled with fresh water. Very little water goes out of the pulp in that short interval but any moisture in the pulp will mix with the fresh water that is let in.

DR. JOHN D. RUE: Was there any appreciable change in the color of the pulp?

MR. BLAIR: I do not think there was, except on the surface. We did not notice any very distinct difference in the color of the sheets.

MR. CAMERON: The groundwood pulp after we got beneath the slime on the top, was very clean.

MR. CROSSLEY: Was anything done to determine the nature of the slime? Was it of the nature of algae and was it of uniformly small quantity or did it vary?

MR. BLAIR: I think the slime is between one-eighth and one-quarter of an inch in thickness. I examined it once and found some diatoms in it.

MR. BRYANT: Would it not be sufficient to pass the water over the surface of the pulp without disturbing the body of it? In that way you would have very little pulp lost.

MR. BLAIR: Yes, I think it would. I know of a case in which one of the large Canadian chemical mills allowed the screenings of low grade pulp to be washed out of the mill. This material had accumulated in the bed of the river for several years. Two or three years ago, I understand, a special plant was put in to recover this material. It was dredged out of the river and subsequently put on the market and sold. Of course this is a different kind of pulp but it involves the same idea of storage and it proved to be a commercial proposition.

MR. MERRILL: Perhaps this will not have any particular scientific interest, but about a year ago excavation work was being done on the Willamette river in Oregon. Fourteen years previously there had been a slide of the bank, and considerable pulp had slid into the river where it had become submerged and it had lain buried in that river during all that time. They came across this big bed of pulp several times. It was dug up and washed because it was dirty in consequence of having been buried, but it was found to be in very good condition. It was put into the beaters and then put over the machines. There was no chemical analysis made but the interesting fact in connection with it was that it had lain in the bed of the river for fourteen years and then made into paper.

MR. WARDLE: I understood Mr. Blair to say that he would prefer the pulp to be stored in slush form. It strikes me that that method of storage would be tremendously expensive. Take a stock of four per cent consistency in slush form; one cubic foot contains four-tenths of a pound of dry stock, and for a storage capacity of 1,000 tons you would need a space of 100 x 100 x 80 feet deep. A great many mills wish to store several thousand tons and it seems to me that the space required for holding the material in this form makes the method prohibitive.

MR. W. B. CAMPBELL: Unless there is some objection to storing it in that form it seems to me that it would be much better to store it as pressed pulp. If the storage tanks were made with compartments so that they could be opened up and if the pulp were pressed in the first place hydraulically and put in there, when the water was drawn out there would be very little difference in the moisture content. As some of you know, after pulp gets a moderate degree of moisture content the bulk of it will not change when it is put into water. You can take pressed groundwood pulp piled up and by measuring the volume of the pile you can pretty accurately get at the air dry content without any moisture testing at all. The water stays on the outside. That would give a chance to store pulp almost as well inside water as outside of it. It would not be necessary to store all of the stock of the mill. It might be held as a reserve just in the same way as the air dry content supplies of coal at certain ports. Coal deteriorates in the air but does not deteriorate in water and understand there are some ports where coal is kept under water. That same principle might be applied to the storage of pulp.

MR. NEILSON: I would like to ask these gentlemen if they have noticed any change in the running quality of the stock. We find that when stock has been stored for about two days it becomes freer on the machines. We have observed an increase of as much as ten per cent in freeness after it has been stored. We are testing for freeness continuously and we have found that if you store pulp you change its running properties.

MR. CAMERON: Freeness went up, but of course we did not have enough pulp stored to run it over the machine. I could not give you any actual data as to the running qualities of the pulp, but it is certain that it increases in freeness.

MR. R. M. DECEW: Are these experiments being carried on to establish the principle? These tests might lead to other experiments which would make the principe more widely applicable. Probably the principle is well known.

MR. STEPHENSON: It just occurs to me that if the Forest Products Laboratories are looking for work, they might follow this up by trying the plan .of smothering the noxious bacteria by storing the pulp in carbon dioxide. It may be that the bacteria require oxygen.

MR. BLAIR: The Industrial Research Council at Ottawa some months ago awarded scholarships for post-graduate students, and at the present time there are two women in McGill University who hold such scholarships. The problem they are working on has something to do with pulp deterioration. I have suggested that they take up some of the questions that we have been discussing. They will perhaps try out some of these ideas before the work is completed. At the same time as this pulp was put in water some crates of freshly lapper pulp were made up and sent to a cold storage warehouse. This material stayed in the cold storage warehouse at a temperature of 34 to 36 degrees for seventeen months and, when we got it out, it was beaten and tested and it tested out very well.

MR. CAMPBELL: In regard to the slime that appeared in the case of the laps, did that appear on the surface of the pile or all through the pile?

MR. BLAIR: The pile consisted only of a number of laps ,one on top of the other. As far as I can tell the slime is entirely on the surface. The dark colored slime does not go into the body of the lap at all.

I think the slime would be all on the outside of the lap. It seems to me that a lot of this slime must come from the sediment which is in the water because at times Montreal water has a good deal of sediment and with the water running over the body of the pulp all the time there must be a good deal of sediment running with it. The slime is perhaps largely due to that.

MR. McNAUGHTON: It occurs to me that in the storage of groundwood the presence of air is a large factor in the deterioration of the pulp. While nothing definite has been recorded, I think it is the experience of those who have had to do with groundwood pulp in storage that where pulp is piled closely. It is apparently in as perfect condition when coming out as when it went in. On the other hand, where the pile is so placed as to allow air to be enclosed deterioration is to be found particularly if there is some fungus growth in the wood from which the pulp is made.. I can recall a time when the practice was to make pulp in laps and tie one hundred pounds weight with string. These bundles of pulp were stored in the warehouse. Almost invariably after two or three months in the summer time, fungus growth was observed to follow the cord lines. This may have been partially due to the contamination in the cord itself but I am inclined to think that a large part of the fungus growth was due to the admission of air, giving opportunity for the fungus to develop.

In considering the idea that is presented this morning it occurs to me that the practical difficulties of any system of storage must be very carefully analysed. Some of these have been brought out this morning.

MR. C. S. V. HAWKINGS: In this connection, we have, under Dr. Bates, carried on, or at least started, a series of experiments with groundwood pulp. We used sodium fluoride and mercurial chloride in these experiments, and upon analysing the rate of fungus growth we found that the fungus growth seemed to follow along the line of partition of the pulp when plied up, which would seem to prove that if the piles were piled sufficiently closely and compressed to any extent the fungus growth would be largely controlled. We have found that sodium fluoride treatment will do away almost entirely with fungus growth. It does not matter then how you pile the pulp; we found that under different conditions the result was the same.

DR. RUE: The Forest Products Laboratory at Madison, Wisconsin, during the last few years has done considerable work in regard to the preservation of pulp and in general we have confirmed the experiments which Dr. Bates has carried on at Price Brothers. One indication which may have a bearing on storage in water, from the limited tests we made in that line, was that the infection which was present in the wood did not persist in the pulp after grinding. In no case, in the tests that were made, were the organisms in the infected wood found later. The conclusion was that the infection in the stored pulp must come from one of three different sources; from the air dust particles; from the infected material in the water, which seems to be a very large source of infection, or from the solid material with which the stored pulp comes in contact, either the flooring, bits of wood, or otherwise. Samples of groundwood pulp under observation in contact with pieces of wood were nearly always found to be highly infected at the point of contact with the wood. If the pulp were kept in running water and if allowed to drain out and the pulp restored in the same way, the question arises as to whether the infection induced by the water itself would not become a source of further decay. The chemical treatments which we have worked with seem to be highly efficient when we have determined the maximum quantity of chemicals necessary. Some five or six chemicals have proved effective and perhaps the most desirable is sodium fluoride to which Mr. Hawkings has referred.

MR. HOVEY: I was wondering if the use of Montreal water highly charged with chlorine would have any effect on the preservation of the pulp.

MR. McNAUGHTON: I noticed that the title of the paper was "The Use of Clean Water as a Preservative for Restoring Mechanical Pulp". When I read that title I wondered if the laboratory was using Montreal water or distilled water.

MR. STEPHENSON: They do not use anything distilled for storing pulp.

MR. LODGE: I think it might be well in any further work that is undertaken to put into the pulp a small amount of ozone. Some work has been done in connection with the destruction of bacteria in oil such as cocoanut oil, in which ozone has been used with good results. The oil is brought from the Philippines in steamers, but by the time it got to England the acidity developed was claimed to be 5 per cent, which made it unsaleable for use in food, thus bringing the value down a great deal. Some work has been done in that regard and now, when they run the oil into the tanks, they give it a treatment of ozone which practically limits the acidity to .10 per cent and the result is that they are able to take these tank steamers on a two or three months' voyage to a hot climate and the oil, when it reaches England, will contain perhaps within one-half of one per cent of free acid.

MR. WARDLE: Have you given any consideration to the thought of passing pulp, before it is lapped, through the ultra violet rays?

MR. BLAIR: No.

MR. CARRUTHERS: I think there is enough material in this paper to cause most men to do considerable thinking. It is a most interesting subject.

This concluded the Morning Session, January 25.

(To be continued.)

Pumps and Their Characteristics

By E. F. DOTY,

(Continued from last issue.)

CHAPTER IX.

Pulsometer, Ejector and Injector Pumps

Steam is the customary source of power for these pumps, although compressed air or water is somtimes used for operating the **ejector** type of pump.

The Pulsometer is a pump in which the driving steam comes in contact with the water. A sectional view of a pulsometer is shown in Fig 44. Steam is admitted at A and if the ball is resting over the left hand opening (thus closing chamber B), steam will enter chamber C — and drive out the water there in.

A sudden change in the steam pressure, when the water surface reaches the level of the discharge valve causes the ball to close the right hand side (chamber C) and then the condensation of the steam on that side draws water through the suction D—and suction valve E—, as shown by the illustration.

When the water is driven from chamber B—the ball is forced over to the left and the operation is repeated.

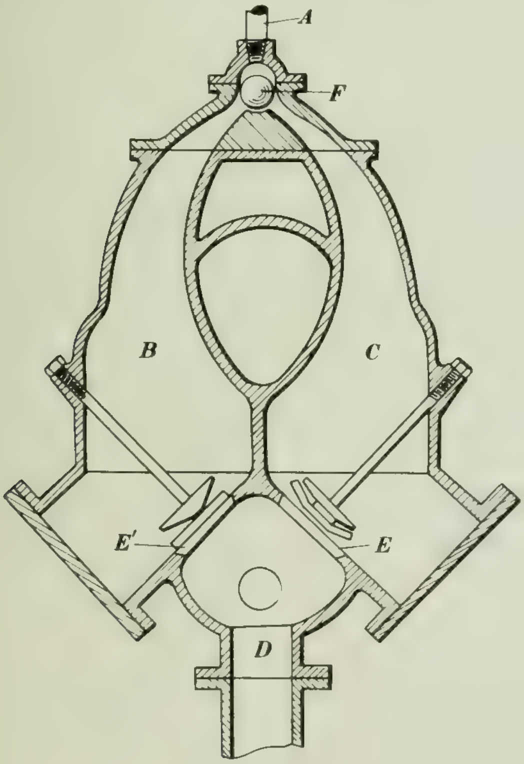

Fig. 44.

Pulsometer pumps are easily applied for contracting work such as pumping out coffer dams and similar excavations where temporary service and where an easily handled pumping apparatus is required and where the pump can be suspended above the work. It is commonly used for this class of work although its steam consumption is excessive. For temporary, rough-and-ready work it may not cost more in money outlay then other types of pumps which are more economical under permanent conditions.

Ejector pumps or **syphons** are used for similar classes of work as the Pulsometer: these pump are also largely used for priming or displacing the air contained in the casing of centrifugal pumps before starting them up.

They are essentially a suction pump and operate through the displacement of atmospheric pressure in the suction pipe or vessel to which they are connected, thus permitting the atmospheric pressure outside of the suction pipe or vessel to press the water into it and fill it up to the level of the ejector.

The ejector consists of a nozzle A within a chamber B as shown by Fig. 45. The steam, water or compresser air used for operating the ejector flows through the nozzle, at high velocity and as it leaves the nozzle outlet it expands, filling the pipe ahead of the nozzle completely with fluid or vapor under pressure, which drives the air or water which may be in the pipe ahead of it and through the discharge opening C, the displaced air or water being replaced by air or water following up through the suction pipe D.

The flow from the ejector pump discharge is steady, the air or water which is forced through the discharge pipe mingling with the steam, water or compressed air which is used for operating the pump.

On account of the principle of operation through which the operating force is expanded to nearly atmospheric pressure when it leaves the nozzles, the ejector pump cannot be used for pumping against heads of more than a few feet above the pump itself. It is customary to use them for pumping and priming service and are arranged in such a way that there will be a discharge to the atmosphere with practically no discharge head.

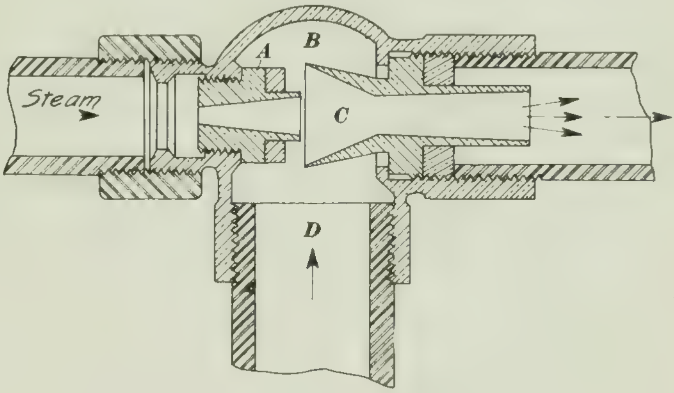

Fig. 45.

The **injector** is a pumping device which utilizes the velocity and condensation of steam for pumping water against pressure and is ordinarily used for boiler feeding, either as the regular source of supply or as an auxiliary to other boiler feed pumps. A section through an injector shown by Fig. 46.

To start the injector the lever handle A, operating valve V, is pulled back a short distance permitting steam from S to enter the space B, between the two tubes. The pressure of this steam entering between the two edges produces such high velocity of discharge across the upper end of space C, that it entrains the air at that point, driving it out through the openings D and E into the space G, and from this into the atmosphere.

This produces a partial vacuum at C and water therefore enters through the suction pipe H, and valve W. This water is taken up by the steam discharge, driven through the combining tube J and is discharged through E and finally appears at the overflow F.

When water appears at the overflow, the handle A is drawn back completely and the steam then discharges through the main nozzle K. The steam in this acquires a high velocity, due to the drop in pressure in the nozzle; this velocity is many times greater than that acquired by water under the same drop in pressure on account of the low density of the steam.

The steam is then condensed by the water, but when the steam particles draw together to form a drop of water their velocity is maintained and drops of water moving with very high velocity, result. This condensed steam can then strike the body of water drawn through H, and by impact impart to it a velocity greater than that which would be acquired by water discharging from the boiler. If this is the case, this mixture of water and condensed steam could enter the boiler under steam pressure, which is the case.

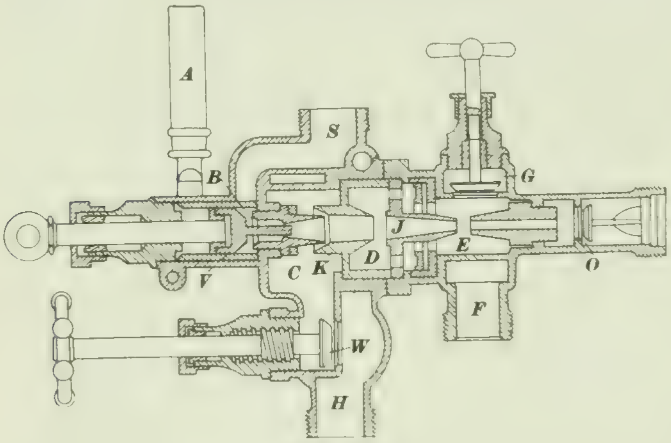

Fig. 46.

The combining tube J is made convergent since the steam is gradually condensed in the passage and the water gradually increases in velocity. When the tube L is reached the steam is condensed and the water is supposed to have its maximum velocity. From this point the delivering tude M, diverges making the velocity less, and with this comes a change of velocity head into pressure head until at the end there is sufficient pressure to force open the valve O, when the mixture will enter the boiler.

The pressure in the space within the end of the combining tube reaches a point of low vacuum of about 25" while at the end of the steam nozzle it is at atmospreric pressure. At the small part of the nozzle, known as the throat, the pressure is found to be 0.58 of the boiler pressure. The pressure at the throat of the delivery tube is usually about atmospheric pressure.

CHAPTER X.

Application of types of pumps for Pulp and Paper Mill Service and suitable materials for their construction.

Ground Wood Pulp.—The selection should be centrifugal pumps of the single stage type either single suction with thrust bearing or double suction if designed with extra large areas in the suction passages.

Enclosed impellers are suitable for handling pulp up to 3 p.c. air dry stock; above this percentage best results are secured with open impellers which will handle pulp up to about 4½ p.c.

Any requirements for handling pulp above 4½ p.c. air dry consistency will require a pump of the plunger type with ball valves and on account of the thick material handled it must flow very slowly. In all cases pumps should be arranged with a gravity feed to the suction whenever possible. Pumps of standard cast iron construction are suitable for this service. **Sulphite Pulp**:—The same remarks as above apply to this material except that it is advisable to use open type impellers in all cases except for short fibre stock up to 3 p.c. The pumps used for blow pit service come under this heading.

Acid Pumps.—Centrifugal Pumps of single stage, single or double suction type with either open or enclosed impellers may be used. The material of which the pumps are constructed in order to resist the corrosive action of the acid handled will depend on the kind of acid to be pumped.

The following list abbreviated by the editor will indicate the most suitable construction for different kinds of acids. The materials referred to in the following list will be understood to apply only to the parts of the pump in actual contact with the liquid pumped; other materials in the pump may be of standard construction.

Liquid.	Material
Alcohol,	Bronze.
Alkaline Water	Cast Iron
Brine	Bronze Fitted
Calcium Acid Sulphate	Bronze
Carbonate of Soda	Cast Iron.
Carbonic Acid	Cast Iron.
Caustic Soda	Cast Iron.
Caustic Sulphite	Bronze
Cellulose	Cast Iron
Choride of lime	Enameled
Chlorine in water	Enameled
Copperas	Cast Iron
Ferrous Sulphate	Cast Iron
Lime Water	Cast Iron
Lye Caustic	Brass fitted
Lye Salty	Bronze
Magnesium Acid Sulphite	Cast Iron
Milk of lime	Cast Iron
Oil all kinds	Cast Iron
Salt Brine	Brass fitted
Soda	Cast Iron
Soda Ash	Cast Iron
Sulphate of alumina	Brass
Sulphide of Sodium	Cast Iron
Sulpholignic Salts	Brass Concentrated
Sulpholignic Salts	Cast Iron Diluted
Sulphurous Acid	Bronze
Sulphurous Acid gaseous	Cast Iron
Turpentive Oil	Cast Iron

The above list has been developed from actual experience in pumping the liquids named as well as from the standpoint of the chemical re-actions which may develop between the different liquids pumped and the metals of which the pumps are made. (Less resistant materials are sometimes used.—Ed.)

The most suitable combination should be selected both with a view to the durability of the pump and the effect of chemical action of the liquid handled. The selection of pumps for handling corrosive and active liquids should be carefully made with these objects in view rather than the first cost of the pump.

Pumps for handling heavy ground wood stock are usually of the single suction centrifugal type with open impeller and of standard cast iron construction. They should be selected of ample capacity so that the passages will be large throughout the pump and permit of very moderate velocities; a flow from the discharge of five to six feet per second will usually result in more satisfactory and reliable operation than when higher velocities are used. As a uniform constant flow through the pumps will be maintained at a fair efficiency.

Pumps for handling light ground wood stock are also of the centrifugal type and may be of either single or double suction and either open or enclosed impeller type. A general rule which may be followed would be to instal single suction open impeller pumps up to 6'' diameter discharge opening and double suction enclosed impeller pumps for units of 8'' diameter discharge opening and upwards.

Higher velocities may be used for light than for heavy stock, for the reason that a uniform flow of the mixture may be maintained at higher velocities and these may be fixed at from 8 to 12 feet per second.

Pumps for handling white water should be of the centrifugal type and either single or double suction with enclosed impeller.

For all of the above pumping services the pump should be located so that there is a constant static head on the pump suction so that the liquid can flow into the pump under a constant head.

General Water Supply Pumps may be of either centrifugal type, and are usually either motor or steam turbine drive, or steam or power driven piston or plunger pumps may be used; but the centrifugal pump is coming more into use for General Water Supply, not only for manufacturing plants but also for towns and cities on account of their adaptability for direct connection high speed electric motors and steam turbines and also their high efficiency and flexibility over a large range capacities.

For steam driven units a high grade of reciprocating plunger pump with triple expansion steam end will usually show a higher duty trial than the centrifugal pump and steam turbine but taken on a yearly running basis and taking into consideration the lower first cost, smaller foundations and housing accomodations and lower cost for oil and attendance the centrifugal pump, steam turbine units will show a lower yearly cost for operation interest and depreciation.

For Boiler Feeding Service it may safely be said that there are, at the present time two standard types of pumps in general use and the capacity of the boiler plant fixes the dividing line types.

This dividing line is determined by the point where the better efficiency of the one type will show that it is an economical investment to spend more money for the original purchase of the pump and get it back again in the shape of interest on the investment by reason of more economical operation.

The two types of pumps referred to are the direct acting type of steam pump in the first place and steam turbine driven centrifugal pumps in the second place. The point where it is usually considered that the two types of pumps meet on an equal basis is in the case of a 2000 boiler horse power boiler plant.

The boiler Horse Power unit is represented, in round figures by the evaporation of 35 pounds of water per hour, this means a plant evaporating into steam 70,000 pounds of water per hour, which, reduced to the normal pump capacity terms means,

$$\frac{700000}{60 \times 8.33} = 140 \text{ gallons per minute.}$$

For plants up to 2000 boiler horse power the direct acting steam pump is supreme while for plants above 2000 boiler horse power the centrifugal Turbo unit will show the best results.

For boiler feeding service the steam driven pump is at the same time the most reliable and flexible unit that can be installed. Being operated by means of the steam pressure from the boilers to which the feed water is being supplied, these pumps may be controlled by means of a pressure regulator, acting on the steam supply pipe to the feed pump; so as to operate at just the proper speed to maintain the water level in the boilers constant under all conditions of load and to follow along automatically and supply the proper amount of feed water and pressure to suit the load conditions.

In the case of the centrifugal turbo unit there is also another decided advantage in that a sudden shut down of the boilers or the closing of a valve in the supply line will not build up pressure beyond approximately 10 p.c. above normal working pressure; and the pump may continue to run under such conditions without serious results.

It may be said that practically all of the larger power plants have adopted the centrifugal turbo unit for boiler feeding service.

(To be continued. The next chapter is on methods of Testing Pumps.)

CHICOUTIMI HONORS SIR FREDERICK BECKER.

Quebec, March 13.—Sir Frederick Becker, the eminent financier, who has just been knighted by King George was tendered a brilliant reception yesterday by the population of Chicoutimi. The Queen City of the North owes much of its progress to Sir Frederick, and Mayor Levesque paid him a tribute which left no place for suspicion in recalling his first visit 23 years ago, when the gentleman who, then plain Frederick Becker, made a contract with the pulp manufacturers for the purchase of all pulp that would come out of the mills of Chicoutimi, Val Jalbert, Port Alfred and Chandler, assuring thus the great expansion of the industry and the city itself. Mr. Levesque also referred to Mr. J. E. A. Dubuc who owns such big interests in the mills and has made Chicoutimi what it is today.

In his reply, Sir Frederick thanked Mr. Levesque for the kind sentiments he expressed and also praised the work of Mr. Dubuc, the man who has made the town.

A hockey match between the Three Rivers and the Chicoutimi teams for the distinguished visitor, who was the guest of the town, was played and was won by Chicoutimi.

The Hon. T. W. McGarry, president of the Whalen Pulp and Paper Mills, Limited, Vancouver, was a visitor to Montreal last week

PULP AND PAPER NEWS

Sir William Price and Mr. George McKee have been appointed by the executive of the Canadian Pulp and Paper Association to act as an advisory committee when requested by the Minister of Lands and Forests of the Province of Quebec. The question of advisory committees for the Provinces of Quebec and Ontario was brought up at the annual meeting of the Association by Mr. Ellwood Wilson, the proposal having emanated from the Canadian Forestry Association. Mr. R. P. Kernan, Mr. Ellwood Wilson, and others interviewed the Ministers of Lands and Forests of the two provinces on the subject and received favorable answers regarding the co-operation of the departments with the pulp and paper and lumber interests in matters of mutual interest. The idea is that the Ministers should consult the committees on such subjects as forest regulations, and thus bring legislators and those interested in the industries into closer relationship. Confidential discussions of proposals affecting pulp and paper and lumber will often obviate friction and unreasonable regulations. The Association has also under consideration the appointment of an Ontario Committee.

Mr. J. A. Bothwell is how president of the Brompton Football Club, with Mr. L. M. Smith, now vice-president, and Mr. H. Grinstad, president.

After a very strenuous hockey game, the Engineering Department of the Brompton Pulp and Paper Company beat the Technical Service Department by two to one.

Mr. C. de Wolf Reid, Montreal, has been on a visit to New York.

It is announced that the Saguenay Pulp and Paper Company, Limited have made a ten-year contract with the Becker interests of London, England, regarding the pulp production of the company. The contract involves a very large amount of money. Sir Frederick Becker, has been on a tour of inspection of the mills in which the Becker companies are interested.

Mr. A. P. Costigane, returning from a brief official visit to the St. Catharines district, reports increasing interest in the matter of accident prevention, coupled with a keen spirit of competition for the flags and shields for 1922.

An interesting exhibition of original cover designs was made at the King Edward Hotel, Toronto, March 8 to 10, by Messrs. Brown Bros., Ltd. The designs were those submitted in the prize contest of the Hampden Glazed Paper and Cord Co. Mr. Wm. Fowler, a member of that firm, who was in charge of the exhibit, gave it as his opinion that in his thirteen weeks' tour he had not noted anywhere a keener interest than in Toronto.

Mr. S. J. Frame, secretary of the Canadian Paper Box Manufacturers' Association, returned yesterday to Toronto after a brief trip to Winnipeg. He reports business men there as being quiet but cheerful.

The Lincoln Paper Mills seem to have entered upon more or less of a new era. We have referred to the change in their Toronto sales office, and to the arrival of Mr. Natwick as Superintendent of the Sulphite Mill.

The new superintendent of the Lybster Division is Mr. Peter Nisbet, who was for some years with the Hammermill Company. With Mr. K. S. Maclachan as General Manager, this mill has an executive equipment that will take some beating.

The Shevlin-Clarke timber settlement was really not a settlement at all, but a compromise. Two actions were settled without litigation and a third was tried. There is no doubt that one effect will be more careful government cruising and better returns.

Mr. Justice Riddell has just brought down his decision in the case of the Western papers against the Fort Frances Pulp and Paper Co. maintaining the validity of paper control by order-in-council and giving judgment for the plaintiffs. The notable feature of Judge Riddell's pronouncement is that to this view such control might be legal even as a peace-time measure.

The Nipigon Power-Great Lakes Paper-affair produced its lurid moments in the Legislature. There is much criticism of the take-it-for-granted actions of both the former and present governments, and even now the only way the $6,000,000 - 30,000 horsepower Nipigon power will be used to any large extent by the Great Lakes Co. is by virtue of other local consumption of the power generated at Kakabeka Falls under private owners.

A recent visitor at the Toronto office of the Pulp and Paper Magazine was Mr. J. L. McNichol, who leaves very shortly by the "Melita" en route to Siam, and who promises to let us hear from him later as to his experiences.

Our congratulations and best wishes to Mr. Norman J. Ratcliff, Secretary of the Ratcliff Paper Co. He is to be married March 15th to Miss R. Henderson of Ottawa.

Mr. Hampshire, who handles J. C. Wilson Company's sales in Maritime Provinces and Toronto, is in the latter city this week.

Mr. Harold Levi, of "Levi's," paper stock dealers, has returned to Toronto from California, where he spent the greater part of a year's respite from business.

Conditions on the Pacific Coast are showing definite improvement as far as paper jobbing is concerned, is the view of Mr. Fred Smith of Smith, Davidson and Wright of Vancouver, who is in Toronto this week.

The fourth-year students in Chemical Engineering at Toronto University paid a visit to the Don Valley Paper Mills Monday of this week, following the course of lectures on Pulp and Paper given by Mr. T.L. Crossley. At the mill the students were received by Mr. Nelson Gain, the General Superintendent, and were given the run of the mill.

Mr. E. H. Wilkinson of the Wilkinson Paper Company, who was recently recalled to England on account of the serious illness of his father, has now returned to Canada, having found his father's condition much improved.

C. H. Fetherstonhaugh of the J. C. Wilson Company is in Winnipeg furthering the Western business of that firm.

Mr. Jos. Ford of Portneuf, Quebec, is a visitor in Toronto this week. Mr. Ford has a welcome of many years' standing.

PULP MILLS BLAMED FOR FOGS.

Navigation in the St. Lawrence River off Wayagamack Island is sometimes made dangerous because of fogs so dense that pilots can not see buoys or shore ranges. The pilots lay the blame on smoke and fume clouds from the pulp mills at Three Rivers, particularly the Wayagamack Pulp & Paper Co., and St. Maurice Paper Co. A conference on the subject was held Tuesday afternoon at the offices of the Minister of Marine in Three Rivers.

Mr. Alex Maclaurin and Mr. F. I. Ritchie were present on behalf of the pulp companies.

In the end it was considered that the best way out of the difficulty was to have a conference between the chemists of the Department and the chemists of the pulp and paper mills concerned, to see if a way could not be devised to obviate the flooding of the surface of the St. Lawrence with these fume screens. A suggestion to this effect was made by Col. W. I. Gear, and accepted by the representatives of the pulp and paper companies, that the various chemists should get together, and see if some method could not be devised to overcome the emission of these dengerous fumes from the mills.

DECARY ON HOWARD SMITH BOARD.

Reduction of the dividend on common, a strengthening of the board of directors, and reports of a much improved business outlook, were the chief features of the annual meeting yesterday afternoon of Howard Smith Paper Mills, Limited.

The reduction of the dividend on common from an eight to a six per cent. basis will perhaps be of greatest interest among the foregoing developments. Although the company's annual financial statement had shown it to be in a very favorable working capital position, the reduction of the dividend had really been expected by the Street as a part of the conservative financial policy under which the organization is now operated. The improvement in business, which now appears to be quite definite, will call for more extensive operations, and, in view of this, the decision of the directors to conserve the cash resources of the company by the reduction of the dividend, met with the approval of the shareholders.

What is regarded as adding considerable strength to the directorate was the election to the board of Ernest R. Decary, formerly chairman of the Administrative Commission of the City of Montreal, to fill the vacancy created by the resignation of J. Anderson, of J. Anderson & Co., New York. Otherwise the retiring board was re-elected unchanged.

It was stated that business at the present time is better by over fifty per cent. than was the case during the corresponding period a year ago. A steady flow of orders is reported and inquiries and purchases from far-flung sections of the world, which had not been in the market for a long time, make the outlook very encouraging.

The company is opening an office at London, Eng., under the direction of Mr. Norman Wainwright, who sailed for England some days ago.

WAYAGAMACK IS NOW OPERATING TO CAPACITY.

Three Rivers, Que., March 10. — Increased activity has been in evidence in the pulp and paper district recently. It is announced that the Wayagamack Pulp & Paper Co., Ltd., is now operating to capacity, and has been so employed for the past two to three weeks. This means that the company is turning out daily 240 tons of pulp and 100 tons of kraft paper.

This is accepted as additional confirmation that this industry is on the mend, and that much brighter times are ahead for this locality, which suffered considerably throughout the business depression and period of commodity deflation.

The fact that the export demand for kraft paper has revived to such a marked extent is accepted as auguring well for the future, and an active year for the district is now conceded.

It is understood that the enquiry for Wayagamack's products comes to a considerable extent from the company's customers in the United States, while enquiries are being received in gratifying measure from foreign countries. One of these has been Japan, which has been a good buyer in the past.

Another interesting point in connection with this industrial revival is the fact that prices for the output display an improving tendency. The margin of profit to the company will thus increase as time goes on and business broadens, and the uses to which kraft paper are put multiply.

MR. BEEDY MANAGER OF THE NASHWAAK MILL.

Senator N. M. Jones, who has for many years been manager of the Nashwaak Pulp and Paper Company's mill at St. John, N. B., has given up this position and gone back to his old home in Bangor, Me. Under Senator Jones' management the mill has been largely remodeled and brought to a state of efficient operation. The new manager is Mr. Howard E. Beedy, who was transferred from the New York office of the company. Mr. Beedy has seen service at the Cape Breton Pulp and Paper Company's plant and has had considerable experience in the pulp industry.

IROQUOIS FALLS LOST TO GRANITES.

Toronto, March 14.—Granites defeated Iroquois Falls 6 to 2 at the Arena last night, and eliminated the northern O. H. A. champions from the Allan Cup series. As the Curlers won the first game 3 to 1, they take the round 9 to 3, and will now play either Montagnards, of Ottawa, or Sons of Ireland, of Quebec, in the semi-finals on Thursday and Saturday of this week. The finals will be played next Monday and Wednesday with Fort William or Regina Victorias representing the west.

PECULIAR ACCIDENT AT PAPER MILL.

A peculiar accident occured at the St. Maurice Paper Co. at the Cape this week when a blind horse went through a skylight. Three or four men who were with the rig, loading material, had gone into the mill and the animal wandered off, headed down the embankment. Not being able to see where he was going, the poor brute tumbled through a skylight into the plunger fire pump. Falling in at 10 o'clock, it was four in the afternoon before the horse was extricated, none the worse except for the loss of a couple of shoes.

NEW MEMBERS OF TECHNICAL SECTION.

At the last meeting of the Executive Council of the Technical Section, the following were elected to full membership: Mr. George Claxton, Belgian Industrial Co. Ltd. and Mr. R. Papineau-Couture, 317 Queen St., Ottawa.

British Trade News

(From our London Correspondent).

Wages Dispute: A Conference.

London, February, 28, 1922. — Delegates from the workers' unions and representatives of the Employers' Federation have met to discuss the working hours in paper mills. It was pointed out at conference that the unions had misconstrued the Federation proposals on the revision of hours and wages, and a small committee has now been appointed, representative of the workers and the Federation, to go into the various questions and submit a report to a further conference. All proposals on hours and wages will be in abeyance until March 14.

Secretary William Ross, National Union of Papermakers, submits a summary of the Federation's proposed amendments, as contemplated, as follows: "An addition of 4 hours to the working week without any payment for same, which is equal to an immediate further reduction in wages of from $1.52 to $1.16 per week. Where the week is extended to 63¼ hours, the immediate further reduction in wages would be $7.30 per week. A still further reduction by stages, of from $4.80 for men to $2.40 per wek for women. Piecework rates to be altered accordingly. Tyers-up and packers to be de-graded to class 3, with consequent loss of a further $1.20 per week. General laborers' minimum wages to be still further reduced to the rates of the district (in which they work) where same are lower than the Federation rates. All the advantages secured re "temporarily employed on certain jobs"; "juniors doing the work of adults"; "double wages for Sunday work"; and "probationary period" to be taken away, while small brown mills are to be discontinued as a condition of the agreement.

The unions put forward the statement that while they have exhausted large funds on unemployed members the Federation of Employers have taken advantage to press forward their new demands.

As the proposals are now suspended, while the small committee work out the salvation of the employers and employees on hours and wages, no definite step will be taken by either side for or against the proposals.

Strike in Sweden.

Half the paper mills are closed down in Sweden through a strike of the workers. Pulp mills are affected also. News reaches London this week that a general lock-out is threatened if things do not subside soon. Swedes point out that the strike is not interfering with the output of paper, but this statement is taken for what it is worth, and those who have returned lately say that Sweden has not had such a "shaking-up" for many years past as she is now experiencing between the ice and strike.

Foreign messages reaching London say that Norway and Sweden have had a heavy winter's ice. There is naturally a shortage of water and conditions are trying. This state of things turns up cost of production and sellers here are putting the rumor about that prices may increase.

A Ray of Sunshine.

Mr. L. G. Chater, writing to a financial paper in London, says: As regards printing and writing papers generally, I can confirm, as one interested in more than one mill, that the worst of the period of depression through which the paper industry has been passing is undoubtedly over, as it has been possible to raise the rate of output considerably during the last few months until it is now nearing the full capacity of the mills. The root of our troubles, besides lack of demand, has been the sensationally rapid fall in the value of raw materials; esparto grass dropping from about £20 to £4, and the best qualities of pulp from £45 to £15, within a period of between 12 and 18 months. Both these materials seem to have reached a price which does not admit of any further reduction; in fact, esparto is now little above its pre-war value. Therefore, so long as paper mills are employed to something near their full capacity, and the products are marked at a price corresponding to the current values of raw materials, the situation can be regarded with confidence by those interested in the trade; many qualities of paper are absolute necessities today, and so long as people read and write they must remain so."

Pulp Situation.

Shipments arriving are small. Business is on a limited scale, but the outlook cannot be said to be gloomy.

Bleached sulphite is quoted at £22; easy bleaching at £14-£15; sulphite newsprint, £13; unbleached soda £12; soda kraft £12-£12-10s.; Groundwood (wet) £5; and ground wood (dry) £10-10s.

Finnish easy bleaching soda is selling at £13-15s.

Becker & Co., Ltd., have been appointed agents for Rattiman Cellulose Fabrik, Rattiman, and the Josefshutte Zellstroffabrik, Vienna.

Esparto Mills.

The Esparto Paper Mills, Ltd., has been registered in London. The nominal capital is £10,000. The following are directors: E. H. Wiseman, S. A. Pierpoint, and G. W. Waspe. They will be dealers in pulp and manufacturers of paper.

Slump Ending.

Sir Fred. Becker has been granting interviews to the London newspapers and expressing his views on the paper industry. He says the slump is drawing to a close, and it is comparable to nothing of the kind within living memory. "From this slough of despond", he goes on, "the trade commenced to emerge in December, steadily and emphatically in the case of newsprint and with greater deliberation in regard to what are known as trade papers. Even in the highest class papers signs of recovery are discernible, especially from Japan ond the Far East; but it may be said that the worst feature of the market is the trade in the best varieties, and no real improvement can be expected until we have a revival of export business. The sudden revival in a newsprint business is entirely attributable to the preference of £3 a ton which the Australian Government has given to papers made in the United Kingdom over all other papers, including those of Colonial manufacture. The Australian market takes over 50,000 tons of newsprint annually, and in future more than half this quantity will be supplied from mills in Great Britain. The result is that all the newsprint mills are on full time, and the biggest establishment of the kind in the world—which I scarcely need add is one English firm—cannot take an order for another sheet of paper this year."

Is English Newsprint the Best?

Sir Frederick says all the newsprint mills with which he is connected have been working full time and over, for in some instances they have not been able to shut down till Sunday morning, which means that, instead of operating a full week of 132 hours for machine, they are running up to 144 hours per week.

"The explanation of the action of the Australian Government," he adds, "must be attributed in a large measure to the quality of English newsprint, which, beyond all question, is the best in the world. It is also the dearest, but the difference in cost is so slight that it cannot weigh against its superiority in quality. It is pertinent to add that the paper slump is not only satisfactory in its termination, but is in itself instructive as evidencing the extraordinary manner in which the industry has come through the worst period in its history. The trade has given a remarkable proof of its soundness and the efficiency of its organization, and under fair circumstances—the collapsed exchanges of German and Finland present conditions that can scarcely be classed under that head—it has nothing whatever to fear in the future from foreign competition."

Canadian newsprint producers will notice in Sir Fred. Becker's remarks that English newsprint is the best in the world. Now this is a direct challenge to Canadian producers. Is Canadian newsprint inferior to British newsprint? It would be interesting to hear what the millowners of the Dominion have to say, because they are now told in black and white, that the Canadian is the inferior. For the sake of the Australian market we want the facts out.

British Pulp Imports Increase.

The imports of pulp for January reached 48,196 tons, compared with 47,065 tons in 1921 and 94,020 tons in January, 1920. The value of the 48,196 is £830,343, compared with £1,204,884 for 47,065 tons. Countries of supply were as follows:

Groundwood: From Sweden, 2,957 tons (280 tons in January 1921); Norway, 16,228 tons (24,943 tons); Canada, 4,492 tons (2,930 tons). Total, 23,677 tons (28,153 tons in 1921).

Bleached sulphite: From Finland 202 tons (January, 1921 nil); Sweden, 580 tons, (99 tons); Norway, 1,300 tons, (1,471 tons); Germany, 100 tons (138 tons); Canada and other places, 70 tons (126 tons). Total, 2,252 tons (1,834 tons).

Unbleached Chemical Pulp: From Finland, 5,158 tons (101 tons in January, 1921); Sweden, 13,704 tons, (12,034 tons); Norway, 1,910 tons (3,291 tons); Germany, 11 tons, (508 tons); Canada and other places, 519 tons (537 tons). Total 21,302 tons (16,471 tons in January, 1921).

Only 965 tons of Chemical (wet) was received in the same period, an increase of 925 tons over January, 1921.

British Paper Exports.

So far as the exports of paper go to show, the export trade is still in a bad condition and taking everything from the mills, including paper bags, playing cards, envelopes, etc., the total export trade for January reached 146,915 cwts, compared with 139,354 cwts in December, and 158,419 cwts. in January, 1921.

Imports.

The imports reached 688,688 cwts. in January, compared with 736,165 cwts. in December and 402,273 cwts. in January, 1921. Wrappings and packings from Canada show an increase. No newsprint was received from Canada only from Newfoundland 10,280 cwts.

Canadian Ingersoll-Rand Co., Ltd., have issued a new bulletin describing the Price-Rathbun type Oil Engines which should be of interest to our readers. A copy will be sent to any interested reader on request.

PREFER CANADIAN TO EUROPEAN PAPER.

Importations of European newsprint and other papers, particularly those from Germany, into the United States, are not coming up to expectations, according to information reaching the headquarters of the Canadian Pulp and Paper Association in Montreal, with the consequence that much less reliance will be placed upon them by American buyers in the future. Spasmodic arrivals of shipments, resulting in either more paper being forced upon the buyer than he is prepared to accomodate, or, in other cases, less than his requirements call for, are said to have proved a source of considerable annoyance and loss. The percentage of pressroom waste is reported to be proportionately greater with foreign than with domestic paper, while the distance from the source of supply to the point of delivery militates against satisfactory adjustment of claims for bad deliveries or imperfect products.

In the meantime, the demand for Canadian paper by United States users shows a steady return to normal. Most of the Canadian mills are now working at above 90 per cent of their maximum capacity. Newsprint buyers, who have not been seen in Montreal for several months, are again making their appearance, and enquiries generally are quite numerous.

In regard to nesprint, there is a feeling that price stability has been reached and that the increased production provided for by mill expansions during the past three years is in a fair way of being, overtaken shortly by increased demand. From United States publishers' sources it is reported that demand for advertising space during the first three months of the year has shown a small but steady increase over last year, while newspaper circulation, which remained dormant during 1921, has again started to grow, being stimulated in numerous instances by active and aggressive campaigns.

Overseas, also, the paper markets are beginning to show improvement, aided thereby by a falling off in Scandinavian production, due to labor troubles and transport difficulties. Dealing with the situation abroad, the current issue of the World's Paper Trade Review (London) says that conditions generally indicate "a stiffening of prices for all classes of papers, especially stocks."

"Supplies for the immediate future, at all events, are bound to be restricted, both on account of the interference with transport and the strike in Sweden, and an influence on prices is bound to follow," says the Review. "At the same time, we have reports of some improvement in the demand for papers in this country. These conditions should furnish an opportunity for British paper mills to sell their products at improved prices. Such an improvement is highly necessary, in view of the fact that paper has been turned out at a figure which allowed of no profit, and, in some cases, no doubt, involved a loss. This state of things has also marked the course of manufacture in Scandinavia, where costs have been out of all proportion to the prices obtained. The outlook for the paper market is, therefore, of a very interesting character, and there is some hope that manufacturers of and dealers in paper will at last come into their own again."

Mr. F. J. Campbell, general manager of the Canada Paper Co., is leaving this week for a four weeks trip to Cuba and Jamaica. That should give the snow an opportunity to make a graceful exit.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. The Effect of Chemical Reagents on the Microstructure of Wood. Allen Abrams, Research Lab. of App. Chemistry, Mass. Inst. of Technology, Cambridge, Mass. **J. Ind. Eng. Chem.**, xiii, 786-790, (Sept. 1921). A new procedure has been developed whereby the action of chemical reagents on the microstructure of wood may be followed readily either by the microscope or by photomicrographs. It consists essentially in first making thin sections of wood and treating these with the reagents under the proper conditions of temperature and pressure. This method has been used in investigating the effects of various electrolytes (cellulose solvents, acids, alkalies, oxidants, and chemicals used in paper making) on pine wood. The effects on the microstructure of wood have been studied both by microscopic observations and by cell measurements. Some of these effects may be summarized as follows: (1) Cellulose solvents act strongly and about equally on the middle lamella and on the cell wall. (2) Strongly oxidizing solutions act on the cell wall but have comparatively little effect on the middle lamella. (3) The ordinary paper making chemicals act strongly on the middle lamella and, relatively, have much less effect on the cell wall. Caustic soda solutions cause swelling of the cell wall, but solutions of sodium sulphite and of sodium sulphide cause little or no swelling. - A.P.-C.

B-5. Log Saw. Can. Patent No. 194,217, Warren Sabin, Tavera, Wis., U.S.A., Nov. 25, 1919. Claims allowed 2. - A.P.-C.

B-5. Tree Sawing Machine. Can. patent No. 194,885, Edwin Louis Dean, Shrewsbury, Mass., U. S. A., Dec. 16, 1919. Claims allowed 5. - A.P.-C.

C-6. Wood Sawing Machine. Can. patent No. 195,134, Donald L. Crist, Richwood, West Virginia, U. S. A., Dec. 23, 1919. Claims allowed 2. - A.P.-C.

C-7. Log Barking Drum. Can. patent No. 195,010, Peder Peterson Westbye, Peterborough, Ont., Canada, Dec. 16, 1919. The drum is built up of pairs of inverted channel bars alternative with M-bars, riveted to circumferential bands. Claims allowed 4.— A. P.-C.

C-7. Barking Drum. Can. patent No. 195,299, A/S Myrens Verksted, Christiania, Norway, assignee of Adolf August Alfsen, Hen Aadalen, Norway, Dec. 23, 1919. In barking drums, an open-ended substantially cylindrical barking drum having a periphery formed of longitudinal separated slats to form intervening slots for the discharge of the bark, and helically arranged angle iron ribs secured to said slats and projecting inwards from the periphery of the drum and making an angle of about 45° with the longitudinal drum slats to engage and longitudinally feed the logs during the rotation of the drum, these helical ribs being oppositely directed in the opposite ends of the drum. Claims allowed 4.- A. P.-C.

C-7. Knife Barker. Can. patent No. 194, 845, John Arrington, Vancouver, B. C., Canada, Dec. 16, 1919. The log is carried longitudinally and non-rotably through a non-rotatable vertically adjustable ring frame. Rotatable disc cutters are mounted on arms radiating towards the center of the frame in such a manner as to accomodate themselves to the irregularities of the logs. Claims allowed 7. - A.P.-C.

C-7 Revolving Drum Suspension. Can. patent No. 194,985, John Stadler, Shawinigan Falls, Que., Canada, Dec. 16, 1919. Claims allowed 7. - A.P.-C

D-0. Wood Fiber. Can. patent No. 195,212, Geo. J. Manson, Toronto, Ont., Canada, Dec. 23, 1919. As a new article of manufacture, a fiber product comprising long and short well-barbed fibers of raw wood and bark, having 22-28 percent of short fibers. Claims allowed 4. - A.P.-C.

F-4. Recovery of Alkali from Black Liquor. Can. patent No. 195, 309, The Dorr Co., assignee of Daniel S. McAfee, New York City, N. Y., U.S.A., Dec. 23, 1919. Unslaked lime is ground with a liquid lime slaking agent in the presence of the ash from the smelting furnace. Claims allowed 17. - A.P.-C.

F-4. Studies in Evaporator Design. W. L. Badger, Expt. Station, Univ. of Mich., Ann Arbor, Mich. **Chem. Met. Eng.**, xxv, 459-463, (Sept. 7, 1921). Experimental data are given for horizontal tube evaporators, showing the relation between hydrostatic head, temperature drop, and heat transmission. The conclusions must for the present be considered as indicating tendencies only, and must be applied with caution to evaporators differing much in design from the one in which they were determined. (For description of the experimental evaporator see **Chem. Met. Eng.**, xxxiii, 159, July 28, 1920.) In horizontal tube evaporators the maximum capacity occurs when the tubes are from one-half to two-thirds submerged. The maximum capacity is reached at levels nearer the top of the heating surface as the apparent temperature drops become smaller. The maximum apparent heat transmission coefficient is 105-108 percent of the heat transmission coefficient where the liquid level is at the top of the heating surface. The ratio of corrected heat transmission coefficients for two different temperature drops is constant for all levels above the optimum. A.P.-C.

F-5. Benefits from Preliminary Impregnation of Chips in the Soda and Sulphate Processes. Chem. Met. Eng., xxv, 463, (Sept. 7, 1921). Chips are impregnated with cooking liquor under pressure before starting the cooking action, the required pressure being obtained by pumping liquor into the digester after it has been completely filled and closed. Laboratory cooks of treated chips on a 50-lb. scale showed greater uniformity of cooking, increased yields, reduced bleach consumption, increased concentration of the cooking liquor, and reduced time for cooking. Mill trials on a 3-ton scale resulted in increased concentration of the cooking liquor, reduced time for cooking, a reduction of the steam required for cooking from 9,000 to 6,000 lbs. per digester charge, and an increase in the concentration of black liquor from the digester from 15 to 18 degrees Baume. - A.P.-C.

G-8. Knife Device for Wet Machines. Can. patent No. 195,114, Eugene Marius Bene, Montreal, Que., Canada, Dec. 23, 1919. Claims allowed 2. -A.P.-C.

G-0. Apparatus for Handling Pulp. Can. patent No. 194,283, The Sherbrooke Machinery Co. Ltd., Sherbrooke, Que., Canada, assignee of Anton J. Haug, Nashua, N. H., U.S.A., Nov. 25, 1919. Claims allowed 8. -A.P.-C.

G-0. Discharge Device for Pulp Tanks. Can. patent No. 194,316, Olaf Quiller and Kristian Holter, co-inventors, both of Christiania, Norway, Dec. 2, 1919. In the bottom of the tank there is a dicharge opening, and above this opening is a vertical spraying pipe having nozzles near its lower end and which can be rotated. Claims allowed 3. - A.P.-C.

G-0. Pulp Distributor. Can. patent No. 195,272, Wm. T. Varney, B. C., Canada, Dec. 23, 1919. Claims allowed 5. - A.P.-C.

K-7 .Bronze Beater Knives. K. Lichterfeld, Ger. patent No. 331,351. Individual knives are set in an iron U-shaped groove which is protected against rusting by a wooden strip.—H.E.W.

K-7. .The Schubert Beating Tester. Crunewald. **Zellstoff u. Papier,** i, 21, (April 1921). The tester consists of a tube closed at one end by a screen and the other end is joined by a rubber tube bearing a stopcock to a mercury manometer. The mercury in the manometer is set at zero on the upper part of the scale and the stopcock is closed. The bulb of the apparatus is closed and a sample of the beaten fiber is placed in a vessel into which the screen end of the tube may be placed. The cock is then opened and the mercury in falling draws the stock against the screen. The time and the distance the mercury drops are measured and conclusions are drawn from these data. Tests conducted on linen, cotton, straw fiber, ground wood and wood cellulose are reported and curves showing the results are given. The Schopper-Riegler apparatus for testing beating was used in this work. Time of beating, roll pressure and stock density are all considered in this work.—H.E.W.

K-8 Dyeing Paper Pulp. Translation by Clarence J. West. **Paper Trade J., lxxiii, 42,** (Sept. 22, 1921). To determine whether it is better to add dye to the stuff in the beater before or after adding to the size, 70 g. of moist bleached sulphite in 150 cc of water and then equal amounts of 1 percent dyestuff solution, rosin size, and alum were taken. The consistency of the pulp was 3 percent. The poorest results were obtained when the order of adding the materials was rosin size, alum, pause, dye solution. The best results were secured when the following order was adopted: dye solution, rosin size, pause, sodium bicarbonate, alum. —H.E.W.

K-12. Paper Stock Regulator. Can. patent No. 212, 660, Lemuel B. Decker, Kenogami, Que., Canada, July 26, 1921. Claims allowed 3.—A. P.-C.

K-12. Oily Steam in Drying Cylinders. Grunewald. Zellstoff u. Papier, i, 60, (May 1921). The view that oil in steam lowers the efficiency of drying cylinders by forming a heat insulting layer is shown to be untenable.—H.E.W.

K-12. Evolution of the Paper Machine. Grunewald. **Zellstoff u. Papier,** i, 81, (June 1921). The article mentions the present tendencies in the construction of paper machines and gives a description of recent improvement in machine accessories.—H.E.W.

K-12. Paper Dryers. Can. patents 194,523, 194,524, 194,525, John Edward Alexander, Port Edwards, Wis., U.S.A., Dec. 9, 1919. **194,523.** The sheet is made to pass through a chamber containing electric heaters. Claims allowed 9. **194,524.** The dryer consists of a cylindrical casing on which are several spiral electrical heating elements suitably insulated from the casing. Claims allowed 7. **194,525.** The dryer consists of a chamber heated electrically, the sheet being carried through on wire screens in a circuitous path, while the heated air follows the same path in the opposite direction. Claims allowed 16. - A.P.-C.

K-125 M-7. Air Preheating Device for Paper Machines. Can. patent No. 194,323, John Edward Alexander, Port Edwards, Wis., U.S.A., Dec. 2 ,1919. Claims allowed 12. -A.P.-C.

K-19. Apparatus for Coating Containers with Paraffin. Can. patent No. 194,470, The Creamery Package Mfg. Co., Chicago, assignee of Theodore L. Valerius and Olaf Larsen, both of Fort Atkinson, Wis., U.S.A., Dec. 2, 1919. Claims allowed 22. - A.P.-C.

K-19. Paper Coating Machine. Can. patent No. 194,-259, Bird & Son, Ltd., assignee of Harry M. French, Norwood, Mass, U.S.A., Nov. 25, 1919. 9. - A.P.-C.

K-23. Paper Reinforcing Machine. Can. patent No. 194,375, Charles Henry Howard, Saugus, Mass., U.S.A., Dec. 2, 1919. Claims allowed 33. - A.P.-C.

M-7. Removal of Steam Mist in Mills. Kummer. **Papier Ztg.,** xlvi, 3429, (Sept. 17, 1921). The article takes up the question of ventilation of mills ad gives a sketch of the system in use in various mills.—H.E.W.

M-7. Ventillation in Paper Mills. Zentr. Papierind., No. 4, 1921. The older ventilators with "propeller and blades" working noiselessly have been made cheaper and more effective by new devices. The improvements consist in the use of a large number of electrically driven vertical fans of the Keith type. — P. B.

· M-8. Pneumatic Pump for Paper Stock. Schaanning System. Wochbl. Papierfabr., lii, 2428, (1921). With this pump 12 percent stuff can be pumped through narrow leaders. Compressed air is blown into the delivery pipe in two places near the pump.—H. E. W.

M-0. Lubricants for Paper Mills. HOYER. **Wochbl. Papierfabr.,** lii, 2842, (1921). Specifications for the oil and grease intended for use in all parts of the mill are given. Oils of Russian and American origin are compared as regards sp. gr., flash point, burning point and viscosity.—H. E. W.

M-0. Baling Machine. Can. patent No. 212, 756, The Galland Henning Mfg. Co., assignee of Karl O. Nelson and Otto Albert, all of Milwaukee, Wis., U.S. A., Aug. 2, 1921. Claims allowed 5.—A. P.-C.

N-4. Use of Peat in Boiler Firing. Anon. **Zellstoff u. Papier,** i, 63, (May 1921).—H.E.W.

N-4. Removal of Incrustations from Condensers. Micksch. **Papier-Fabr.,** xix, 781, (July 29, 1921). Chemical methods of removing calcium sulphate and calcium carbonate incrustations are given. A solution of 6 1. of hydrochlorine acid in 100 1. of water is allowed to stand in the tubes 10 hrs. Substitutes for this solution are mentioned.—H.E.W.

N-4. Flue Gas Analysis. Blau. **Zentr. Papierind.,** No. 16, 1921. Description of a new apparatus for analysing flue gas as an indicator of the quality of fuel and the efficiency of firing.— P. B.

N-6. The Construction of Turbine Engines. Pappen u.Holzstoff Ztg., No. 14 1921. The turbine engine of modern construction means a gain in power transmission in mills where water power is available, provided the turbines are built of the rapid, high pressure type.—P. B.

N-4. Use of Vapor Accumulator Systems in the Paper Industry. Hakanson. Papierfabr., xix, 929,957, (Sept. 2, 1921).— H. E. W.

P-1. Electric Safety Devices in Paper Mills. Papier Markt, No. 14, 1921. The dangers of defective insulation, short circuits, etc., in rooms containing moist and inflammable materials are obviated by means of a new installation or "transformer".—P. B.

UNITED STATES NOTES

What promises in some respects to show departures in the way of industrial exhibitions is scheduled for Boston next August, when paper manufacturers and dealers will put on display there numerous interesting manufacturing processes and exhibits of materials from the raw to the finished product. The event is to be known as the Boston Graphic Arts Exposition. Buyers and members of the International Association of Printing House Craftsmen are being urged to make it a point to visit the show. Addresses on paper subjects will be included in the program, and these addresses will be printed and sent to the membership. For the first time at any exposition, there will be a complete working unit of a folding-box making plant. Large cylinder presses will be run on two color, folding boxes for a Boston manufacturer. Cutters and creasers, glueing machines, bundle tyers and a baling machine complete this unit.

James E. Mitchell, manager of the Utica Paper Company, is planning to erect a factory at Utica this spring for the operation of a toilet tissue plant. He has purchased a site and intends to have building operations begin at an early date.

The village of Malone, N. Y., which already has planted 30,000 trees in a municipal forest, has been offered two additional parcels of land for deforesting purposes by the Malone Light and Power Company—one of thirty-four acres and the other of eighty-eight acres. One offer has been accepted. The plan is, as soon as all the land has been accepted, to carry on planting each year until the whole tract has been reforested.

The United States Gypsum Company has come into control of the mill of the Lancaster Board and Paper Company of Ohio.

A community tree planting project just launched is a school district forest in the town of Florida, Montgomery County, New York. One acre has been obtained opposite the school, and the state will supply the trees free, while one citizen has offered to supply the posts for fencing.

The New York State Conservation Commission's receipts from the sale of trees for February were more than four times as large as for the corresponding month last year, in spite of the fact that some of the largest orders were for planting on publicly owned land, for which purpose trees are furnished free.

The Superintendents' "Annual," to be published in connection with the joint international convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, promises to be a highly interesting and instructive publication. Copy intended for its pages is making up a good part of the mails being received at the association headquarters in Kalamazoo, where the joint convention will be held early in June. Arrangements have been completed for the printing of the "Annual." The job of printing and binding will be done by Ihling Bros. & Everard, Kalamazoo. The Paper Trade Journal, the Paper Mill and Wood Pulp News, Paper, the United State Papermaker and other trade journals will have special men on hand at the convention to cover all deliberations.

No extension having been provided for by Congress, the duty free limit on print paper goes back on April 23 to paper sold at not over 5 cents a pound. It may be recalled that on April 23, 1920, Congress enacted a law which raised the limit to 8 cents per pound under which print paper could be imported into the United States duty free. The law provided that it would be operative for a period of two years, expiring on April 23 of this year unless Congress extended the period before that time.

The plant of Oscar Gumbinsky & Brothers at Kalamazoo, Mich., will be conducted in future by the Waste Paper Packing Company, a corporation capitalized at $100,000 and recently organized for the purpose of taking over the Gumbinsky plant to conduct a general waste paper and stock business. Stockholders of the new operation, at the first meeting held in Kalamazoo recently, elected the following officers: Felix Pagenstecher, president; Charles Clarage, vice-president; C. Allen Fox, treasurer; William Allen, secretary; and Louis Rosenberg, general manager..

Improvements and renovations whereby its plant at Skowkegan, Maine, will substitute electric for water power have been almost completed for the Kennebec Pulp Company, and it is expected that the mills can be made ready to resume operations about April 1. The plant has been closed since last July. Work of completely altering it was started last December, when 16 men were put at the task by the new management. One large motor of 750 horsepower has been installed and four smaller motors, giving an aggregate of 1,000 horsepower, which will greatly increase the production of the plant. When full time operations are resumed next month, about thirty hands will be busy on day and night shifts. A contract has been made to supply the Keyes Fibre Company of Waterville with between 4,000 and 5,000 tons of pulp yearly.

His many friends will regret the death of Mr. H. B. Prather, who has for many years been connected with the Pulp and Paper industry as a Consulting Engineer and in that capacity had served and was well known by a large number of mill officials all over the country. The end came unexpectedly, he being stricken on the night of the 8th and lingered until two-thirty in the afternoon of the 9th, at his residence in Cleveland.

The business of H. B. Prather & Company, Consulting Engineers, will be continued.

QUICK PAPER SHIPMENT.

A wire received tuesday would seem to point to a rather insistent demand for Canadian newsprint in the United States, as well as to the expedition with which shipments can be made from Canadian mills to distant American points. The wire was to the effect that Monday morning's issue of the Chicago Tribune being sold on Chicago streets had been printed on paper manufactured at Iroquois Falls on Friday. A solid train of forty cars of Abitibi paper had left Iroquois Falls at 5 o'clock Friday afternoon, travelling over the T. & N.O. Railway to North Bay; from North Bay by C. P. R. to Windsor, and by the Michigan Central to Chicago, where it arrived at 7.25 p.m., Sunday.

The Markets

CANADIANS TRADE CONDITIONS.

Montreal, March 14. — On the whole, the paper trade continues to be satisfactory. Some sections are more brisk than others, but in no department is there cause for pessimism. The outlook is good, far brighter than in some industries. It is true that, as a rule, the orders are not large, but then consumers are in no mood to enter the market in a free way. There is an all-round policy of caution, with prices on a firm basis.

The demand for newsprint is fair. The first shipment of the order given by the London "Daily Express" to Price Bros., will go this month. The total is, 13,500 tons. This business, which was secured some time ago, is evidence that Canadian papermakers can, despite the keen competition of Scandinavia, get orders for Great Britain. The position is a curious one, in that European countries are sending newsprint to the North American continent, and that we are also shipping newsprint to the other side of the ocean. Thus we find ocean consignments going from east to west, and per contra, consignments going from west to east. This securing of business in far-off fields is no doubt of benefit to the shipping companies in the way of freight; but is questionable whether the paper companies would not find it more profitable if the production could be sold in what may be termed their own immediate spheres. Despite the efforts of European mills to secure trade in the United States, Canada is holding her own in that market.

Kraft has strengthened in demand and price. Not only is the domestic consumption better, but the foreign trade is on the up-grade. According to a report from Three Rivers, the Wayagamack mill is now operating at capacity, the company having obtained considerable orders from the United States in particular.

Book and fine paper orders are of fair volume, and wrappings have improved. The demand for tissues and toilets is also satisfactory. The market for boards is spotty, the demand varying considerably.

The pulp market is quiet. Groundwood is slow, but sulphite is moving a little more freely.

As Toronto Sees It.

Speaking of the tariff attitude of our big neighbor or rather that expression of it exemplified in Mr. Fordney's *codex expudgatorius*, a recent writer says that, if one quits buying from one's neighbors, it may be hard to find anyone to sell to. This principle has a very distinct bearing on market conditions today.

There was a condition known as a buyers' strike. This could not go on long before it became apparent that therein lay the road to stagnation. Not organized, it arose in a spontaneous but very general way. The result was an attack of ague for trade which is still shivering. "How many bananas, or Brussels sprouts; how much beef, boots or bacon, will be bought Saturday night?" thinks the retailer. He used to buy bags and wrapping a month or so ahead; now he buys scarcely enough for a week and leaves that to the last moment, and the man who gets in then gets his little order. This means more men on the road, more visits per man, and less business per both.

That is what we are experiencing round here, and there will be no marked improvement in lines of paper containers, wrappers or bags until an atmosphere of confidence, in a future extending to one or two months ahead at least, is restored to the mind of the 10,000 retailers in Toronto and probably as many more outside.

Pulpwood. There is quite a wide variation in prices of pulpwood in various parts of the Province. In Western Ontario as high as $7.25 per cord is given as the average price for wood on the river bank, as compared with $13.50 a year ago. Elsewhere we find settlers' wood quoted at $4.50 to $5 per cord on the cars.

Pulp. The pulp market shows comparatively little life, although reports come from Nova Scotia of fairly good movements on groundwood. Apparently chemical pulps are moving principally on contract, with natural sulphite bringing $55 to $65 per ton and bleached sulphite quoted at $100, with an occasional shading of price to move certain lots of pulp and to compensate for long freight hauls. Kraft pulp is fairly steady at $70.

Paper. Kraft wrappings are quoted at 8¾c. per pound. No. 1 manilla is 7½c. with fibre manilla 7¼c. and B manilla 5¾c. Grey brown wrappings are priced at 4¾c. to 5½c. The discount on manilla bags is 65 p.c. and 2½ p.c. and kraft 70 p.c and 2½ p.c.

The market for bristols, tags and covers is still rather quiet, but conditions this week indicate an improvement over last week. Tissues and toilets are in a firm position, and business of fair volume is passing.

Paper Stocks. The price on paper stocks has remained unchanged for the last couple of weeks. The market is steady and shows a little better tonnage in book stocks and mixed paper for boards, the latter moving quite freely at $12 to $13 per ton. A fair tonnage of magazines is also passing at $1.65 per 100 pounds. No. 1 white book stock is quoted at 3¼c. to 3½c. per pound. A very quiet condition reigns in the rag market.

NEW YORK MARKETS.

New York, March 11. (Special Correspondence)— Trade in paper of most kinds in the New York market continues to be largely of routine character. There is a steady call for small lots, and buyers are coming into sight more often, indicating that their requirements are gradually broadening; but the wholesale movement of supplies into consuming channels is far from what it ordinarily is. Reports from manufacturing centres are not too bright, telling as they do of mills in a majority of cases operating on part-time schedule and with paper producers generally complaining of the unsatisfactory conditions applying to demand and prices. There seems no question that the paper situation is slowly improving, but the process is extremely gradual, and aside from an occasional spurt of demand for some certain kind of paper which invariably is short lived, the market is minus important trading features.

Statistically, however, matters are steadily assuming a much more encouraging aspect, and the general im provement in business in various other lines naturally leads paper manufacturers and merchants to look for better times in their industry. Newsprint continues to move in relatively good volume. There is not enough business available at present to warrant full production by all mills, but it can be said that most newsprint plants are running at a fairly good rate of capacity, and further that they are finding an outlet for practically all the paper they are producing. As the pre-Eastern and spring buying season approaches, it is obviously probable that consumption of newsprint will increase, and publishers are reported in frequent cases preparing for the future by placing contracts with newsprint manufacturers covering supplies of paper for forward shipment.

The book-paper market is commencing to show signs of improvement. There is what could be described as a very cautious demand now prevailing, that is, printers and publishers are buying for the most part only to cover actual and immediate requirements; but it is quite noticeable that orders are increasing in number, even though the volume of the orders placed is small. Reports from trade-paper circles to the effect that advertising in trade publications is at last on the rise should be encouraging to book-paper producers, as this should lead to a larger consumption of book papers. Advertising in fiction and other periodicals also is increasing, which should make for more business for book-paper manufacturers.

Quotations on book papers are still far from firm. Competition among manufacturers is so keen that a wide variety of prices is named, and mills are not letting price stand in the way of them procuring as much of the business as is available. An instance is cited where a certain large book-paper manufacturer a few days ago accepted an order for 200 tons of machine-finished book at a price which meant a net loss of $10 a ton, simply to obtain the business and keep the mill busy. Machine-finished book of average quality is quoted at around 6 cents a pound f.o.b. New York, though there is no secret in the trade that some producers are taking orders at 5.75 cents in certain instances. Coated book papers are quoted at from 8 cents a pound up to 10.50 or 11 cents f.o.b. New York, depending on grade and quantity.

Fine papers show a little better position. Demand is gradually expanding, and mills here and there are finding it necessary to increase their output. A favorable factor in the fine-paper trade is that practically all the paper now being ordered from mills is going direct into consumption. Jobbers are not buying except to cover commitments to their customers, and the latter are absorbing supplies only when pressed by necessity. Prices evince a steadier tone than in some time, and manufacturers say that advances are not out of the question if raw material continues to cost as much as it does at present.

Wrappings and tissues display little change of note. It is expected that both these kinds of paper will soon begin to move in larger amounts, and some retailers and other consumers are reported as already placing orders for future deliveries in preparation for the pre-Easter shopping period. Quotations are about unchanged, No. 1 domestic kraft wrapping being quoted at around 7 cents per pound f.o.b. New York, with some of the larger mills quoting 7.50 cents, and No. 1 white tissue being quoted at about 90 cents a ream f.o.b. New York.

Demand for box boards is on the rise. Paper-box makers are careful buyers, generally absorbing only such tonnage of board as they directly require, but there is nevertheless an increasing movement from mills to consuming centers. Moreover, manufacturers are maintaining prices firmly at around $40 per ton f.o.b. New York for filled news board and $37.50 for plain chip board.

GROUND WOOD. — While the current demand for mechanical pulp is said to be no greater than ordinarily, quotations display a fairly steady undertone, and producers and dealers argue that a strong factor is that there is no surplus of pulp of any importance awaiting buyers. From all indications, the domestic output is being readily absorbed, principally on contract, to be sure, but nevertheless is being taken out of grinders' hands. Supplies imported from Canada also are finding a more or less ready market, and it seems significant that there is very little selling pressure in the market. Around $32 per ton f.o.b. grinding plants is an average of prices quoted by domestic producers, and dealers in New York who are bringing ground wood down from Nova Scotia by schooners to this port report sales at $33 to $34 a ton f.o.b. New York, with considerable tonnage involved in the sales being negotiated. Board and paper mills within a moderate radius of New York are said to be obtaining a large portion of their supply of ground wood from dealers in this city, and trade in pulp in this connection is reported assuming fairly modest proportions.

CHEMICAL PULP. - Business in chemical wood pulp is moving along at a fairly even pace, with the market showing little or no feature. Demand in the aggregate is light, as consumers are buying evidently solely with the view of satisfying immediate needs, yet there is business of fair volume going through. No important fluctuation is reported in quotations. Sellers in some cases are granting price concessions to move certain lots of pulp, but there is no general revision of prices; on the contrary, quotations are very well maintained.

Kraft pulp displays probably the easiest tone, and some sales of foreign kraft are reported at about 2.60 to 2.65 cents a pound on the dock at New York and other American Atlantic ports. Soda pulp also is rather easy, with the leading domestic producers asking 3.75 to 4 cents a pound delivered, but in frequent cases accepting lower figures. Sulphite prices are steady.

RAGS. — Demand for papermaking rags is slow. Paper manufacturers are buying in very spasmodic fashion, and, on the whole, are not absorbing sufficient rags to sustain the market, with the result that there is a downward tendency to prices on most grades. Roofing rags continue to sag, and sales of No. 1 packing at less than one cent a pound at dealers' shipping points have been reported, while No. 2 roofing is bringing only around 90 to 95 cents a hundred pounds f.o.b. shipping points. Old whites incline downward, and so little business is passing in old blues that it is a question how low they can be bought. New cuttings of most kinds are neglected, although a little better call for No. 1 white shirt cuttings has prevailed this week, with mills offerings an average of 9.50 cents a pound at shipping points.

PAPER STOCK. — There is less demand reported for the high grades of old paper, and prices in some instances have moved a bit lower. On the other hand, low grades, especially those consumed by box-board mills, hold up fairly well in demand, and prices on these descriptions rule steady, Brokers in New York report sales of flat folded newspapers at 62½ to 65 cents a hundred pounds f.o.b. this city, and of No. 1 old mixed paper at 50 to 52½ cents a hundred pounds. Soft white shavings

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are slightly off in price, with most mills bidding no better than 3.10, to 3.15 cents per pound at shipping points, and hard white shavings are selling at about 3.90 to 4 cents a pound. Old kraft paper holds moderately steady at 1.85 to 1.90 cents f.o.b. New York, white blank news cuttings at 1.75 cents, overissue newspapers at 85 cents a hundred pounds, and print manillas at 90 to 95 cents.

OLD ROPE AND BAGGING. No further decline is reported in prices on old rope, about 4.25 cents a pound New York representing the basis commonly quoted by paper mills for domestic manilla rope in No. 1 condition. Old bagging is in slightly better demand, and dealers ask a cent per pound New York for No. 1 scrap and about 75 cents a hundred pounds for roofing bagging. An increased call for roofing bagging is explained by felt manufacturers finding a broader outlet for low-grade felt paper than ordinarily and a consequent larger use of bagging instead of rags in the manufacture of roofing felt.

WOLF BLEACHER IN SUCCESSFUL OPERATION.

The R. B. Wolf Company, of 42 Broadway, New York City, have recently installed in the plant of the Newton Falls Paper Company, Newton Falls, New York, three of their new bleachers. These bleachers, according to reports received from the mill, are giving some very remarkable results and promise to revolutionize the process of bleaching pulp.

The stock is bleached at a concentration of 18% and over and because of this great density the maximum bleaching temperature does not exceed 80° F. This compares with an average of about 110° F. normally used. Because of this lower temperature and greater concentration only about 12% of the usual amount of fuel is required, which means a saving of approximately $1.00 a ton, at the present price of fuel. In spite of the very great density of the stock, the power required is very little more than is used in any other process. This is due to the manner in which the stock is circulated and to the fine mechanical design of the apparatus.

It has for a long time been known that bleaching at great densities effects economies in fuel and also enables the bleaching to be done with less chlorine and with less loss of fibre. Experience with this new system so far indicates that at least twenty five percent less bleaching powder is required and the shrinkage, due to the bleaching, is at least twenty five percent less than with other proceseses now in use.

It is claimed the savings mean a reduction in the cost of bleaching of about $1.00 a ton of pulp.

By far the greatest advantage, however, by the use of this new process comes from the increased cleanliness of the pulp. The low bleaching temperature combined with the great concentration permit the bleach liquor to thoroughly penetrate the discolored woody fibres, so that the coloring matter is completely removed; in other words, the organic dirt is removed by bleaching.

The Newton Falls Paper Company, because of the installation of this process, is now able to use all of their wood just as it runs from the wood pile, with practically no culling out of rotten or discolored wood. They are now producing a very clean and exceptionally fine quality of bleached pulp and from this pulp are manufacturing a bond paper that has already created very favorable comment, because of many strong bond characteristics.

NEW BOOKS.

Coal Manual. F. R. Wadleigh. 184 pages, 4½ in. by 6 in. Published by the National Coal Mining News, Cincinnati, Ohio.

Numerous books dealing with the subject of fuels and coal have been issued from time to time, but they usually have been written from the technical viewpoint of the engineer or chemist, or to meet the needs of the man in charge of power plants or locomotives. Few books have been available, however, which gave in a concise and accurate manner the general elementary information desired by a large number of men, such as purchasing agents, storekeepers and others who are more or less interested in some phase of the coal question other than that of actual mining. This manual has been prepared by a man who evidently knew his subject and in addition recognized the wants of the men for whom he was writing.

The subject matter has been well arranged and by the use of frequent subheads and an excellent index any information desired can be found readily—features which will increase the usefulness of the book for reference purposes.

Among the subjects covered are: kinds and commercial grades of coal; information in regard to the location of coal fields and the essential differences in the character of coal from various fields and seams; the preparation of coal; coke and gas manufacture; the use of coal in locomotives, stationary boilers and furnaces; storage and prevention of spontaneous combustion; specifications and their use; analyses and effects of various impurities, together with a brief bibliography on the subject of coal.— Railway Age.

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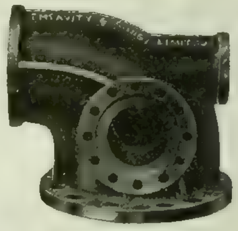

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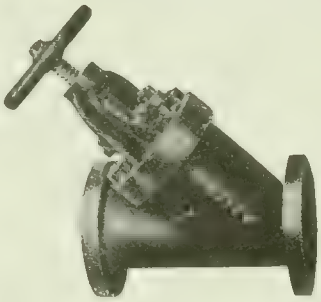

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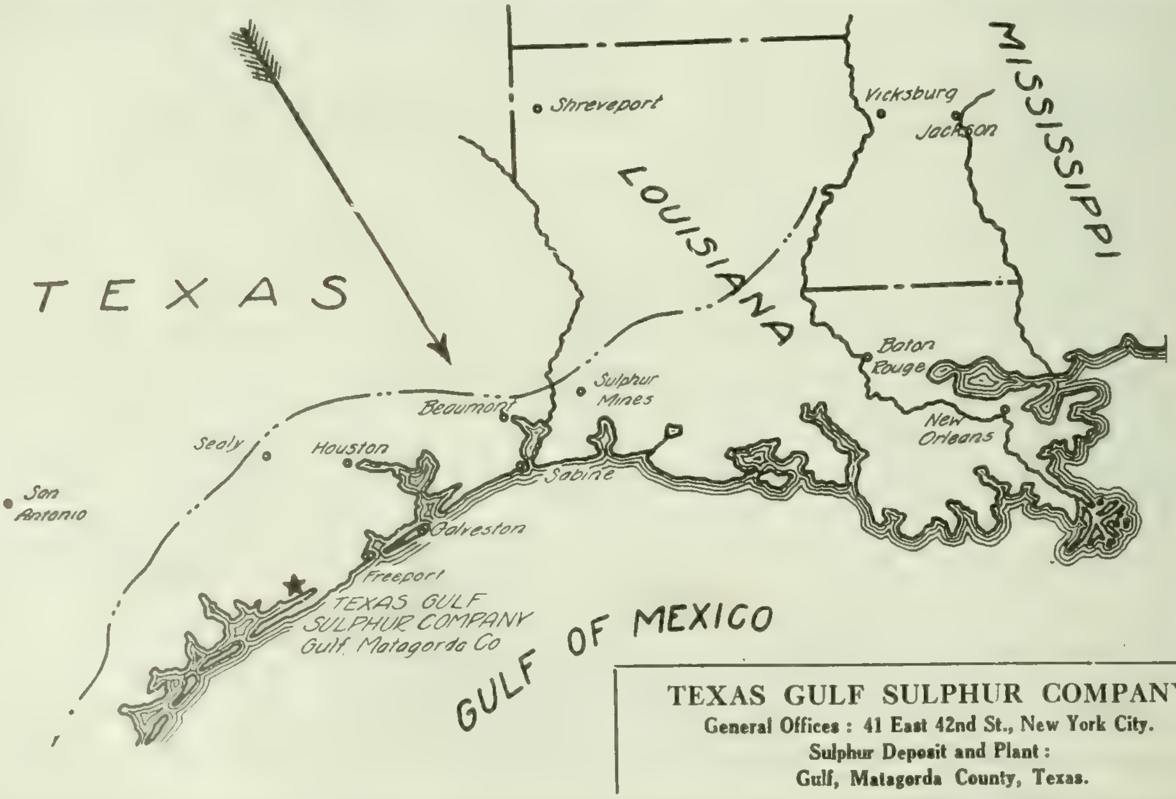

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EDITORIAL

HAVE COSTS HIT BOTTOM?

Annual statements of some paper makers will show very serious losses for the past year. As one man expressed it recently, their books are drowned in red ink. It was necessary in many instances, probably most instances, for mills to write down, probably by half on an average, the value of stocks of raw materials. This was an immediate misfortune that may or may not have been provided for by inventory reserve. If an inventory depreciation fund had not been maintained the mill immediately had a dead horse to pay for. There is only one way in which that can be done, namely, to make current sales at a profit over current costs of manufacture. There could scarcely be a paper mill now which has not exhausted its supplies of high price raw materials although many pulp mills or pulp departments of paper mills still have large quantities of wood. In such cases it is necessary to provide for at least a year's supply of the raw material. The paper mill, therefore, which has used its high price pulp should now be basing its costs on current pulp prices and current costs of labor. The prices quoted on some grades indicate that quotations have been cut to such a point in frantic effort to make sales that it seems doubtful whether current costs of operation and selling are covered.

There is still talk in some quarters of lower prices of paper. Several factors must be considered in making any such prophecy. The principal items of cost are raw materials, manufacturing wages, selling costs, and overhead for construction and management of plants. The last item is generally fixed for a considerable period and could usually be changed only by a re-issue of securities at a more favorable rate but we notice that most consolidating or converting issues are put out at a higher rate than the original. Administration and selling costs can be reduced only by cutting salaries or selling more goods. Manufacturing wages, frequently called labor cost, may possibly be reduced a little, but with the check in the downward movement of most items of cost of living (the only important exception apparently being the matter of rents) there does not seem much justification for much cutting of wages, although apparently there has been a greater proportionate decrease in wages of unskilled than skilled labor and a slight readjustment may here be in order. When we come to costs of raw materials we find that we again are faced with the same factors as applied to the manufacture of paper.

If we take the case of pulp we find a very great decrease in costs, greater in some cases at least than in the drop in price of the finished product. It is necessary to consider then, whether there is any hope or justification for a decrease in the price of such items. The market price of rags and waste papers is now at a point where there is little or no inducement to save or collect them. The price of pulps, as had been said, have been materially reduced. Future prices must be based on the same cost items as for paper. It is difficult for us to foresee any material reduction in our interest charges or labor cost and a decrease in what may be called office expense can best be accomplished by retaining the apparently high priced, but undoubtedly efficient, high-class manager and salesman by whose efforts sales are maintained and increased. The raw material for pulp is wood and the cost of this is made up of several factors. In the first place there is the value of the wood on the stump and this is becoming more and more appreciated as illustrated by the constantly increasing prices paid. With this increase in value of timber we have a fundamental increase in cost of wood which will to a considerable extent offset the only possible reduction in wood costs, namely, in the expense for labor in logging and driving. While there is a temporary and to some extent perhaps permanent drop in woods wages, there is a relative increased cost or at least an increased expenditure of labor in logging the more poorly wooded areas and in the longer drives to the mills. There is no decrease in the working capital necessary to maintain a block pile and pay ground rents, taxes, and fire protection, the interest on which items comes regularly on. We cannot figure out, therefore, any basis for lower costs of pulp and in cases where the wood cost dominates the situation, there is more likely to be an increase than a decrease.

Business generally is improving; it is a slow process as everyone admits but the move now is in the right direction. Increased business means increased consumption of paper and increased distribution of paper means either an increased loss or an increased profit depending upon whether the selling price is below or above the aggregate cost of the product. Cutting prices has been shown to be a miserable failure. It is time now for the industry to determine on getting a legitimate profit and stabilizing prices on this basis even though it means a slight increase in selling price. The industry simply cannot stand any more losses and now is the time to start things on the up grade. The psychological effect of putting sales on a profitable basis cannot help but be encouraging.

If there is an economic basis for decreasing prices, it will manifest itself in a gradual process. The big tumble has come. The skier has taken the jump; and the momentum of the drop is largely spent.

HELP THE OTHER FELLOW.

More than a thousand persons connected with the Pulp and Paper Industry will be in New York during the week of April 10th to attend the Convention of the American Paper and Pulp Association and affiliated organizations. Without doubt more than half of these will come from points at a distance from New York City. After much effort the secretary of the Association has succeeded in making arrangements for a reduced fare for the return trip to those who attend the convention. In order to obtain this concession for any delegate it is necessary that 350 certificates be turned in during paper week to the secretary. By asking for a certificate when your ticket is bought and presenting it to the secretary **on arrival** in New York, everyone who presents such certificate is entitled, but not required, to purchase a return ticket at one half the regular one way fare to the same starting point and by the same road provided 350 such certificates are filed. It wont cost you any more to apply for such a certificate when you purchase your ticket and it may save both yourself and others a considerable amount in railway fares. Just think how badly you would feel if you neglected to ask for such a certificate or forgot to turn it in to the secretary and there were 349 friends and business acquaintances in New York deprived of the reduced fare privileges in consequence.

The reduced fare applies to all those attending the convention no matter what section or association one may be connected with and it applies also to dependent members of a delegate's family who come with him.

There are two points to keep in mind. Ask for a reduced fare *certificate* (not a receipt) when purchasing your ticket. Have the certificate validated by the special railway agent at the convention on April 12th and 13th, which is the only opportunity.

COBWEBS.

The whole industry should be proud of the fine record made by the Iroquois Falls Hockey Team. It is some satisfaction to have the third best team in Canada.

Toronto has a paper merchant dealing exclusively in paper for the printer. Fred. W. Halls Paper Co. not only serves as a joint or common stock room for the Toronto printers, but has been telling them in a series of forceful bulletins that there is a Canadian paper for every job. Strong arguments are given to show why Canadian papers should be used. The sun never sets — or rather, the lights never go out—on an unfilled order in this distributor's office.

The Edmonton "Bulletin" suggests "Reciprocity or no pulpwood" as a slogan for Ottawa. We believe the restriction on the export of pulp wood, desirable and even necessary though it is, should not be put on such a basis. It is a matter demanding attention as life insurance for our national industries and welfare and not a pawn in the political game.

It will be quite worth while to attend the Joint Safety Association in Toronto, April 4 and 5, at the King Edward Hotel. Mr. George Carruthers is the chairman for the 5th.

Have you reserved a room in New York for your stay during Paper Week, April 10-14? They don't allow sleeping on the park benches any more!

WALDEN'S ABC POCKET GUIDE FOR 1922.

Here are three of the many good points about this book. Two dollars will buy it.

1. A list of Paper Distributors in the United States and Canada, with personnel of each company and kinds of paper handled by each house. This list also includes addresses of mill branch offices, mill agents, etc.
2. A list of Paper Mills in the United States and Canada, with names of officers or owners of each concern, kinds of paper made at each mill, trim or width of the mchines, daily capacity, etc.
3. A list of Manufacturers and Converters of Paper, classified according to grades made and including makers of Glazed and Coated Papers, Gummed Papers, Toilet Paper, Paper Towels, etc.

The guide is Published by WALDEN, SONS & MOTT, Inc 41 Park Row, New York

Orders may be sent to the Pulp and Paper Magazine. Magazine.

DUTY OF FORESTERS.

(By Dr. C. D. Howe.)

"I like to emphasize with all my strength that the object of a forester is not to protect trees from being cut. There would be no foresters employed in this country or in any other country if there were no lumbering operations. It is the forester's business to produce wood, and if he can make money in cutting and selling trees three inches in diameter he is doing perfectly legitimate business.

"The guiding principle in forestry is to see that wood production is continuous for all time; to see that areas that have been cut over shall come up again in commercial trees; that areas having been burned over shall be regenerated with commercial trees; and that waste lands and areas unfit for agriculture shall be made to bear commercial trees."

A GEM.

Dilys writing in **L'industrie Chimique** of November 1921, p. 442, dwells on the importance of developing new sources of supply of liquid fuel in France, and strongly advises developing the production of synthetic alcohol from acetylene and from **sulphite of cellulose.**

Donnacona - Lord of Canada.

DONNACONA, CHIEF OF THE MOHAWKS.

When the great French explorer, Jacques Cartier, returned to this continent in 1535, after having seen the Gaspe country the year before, he sailed up the mighty river which he named the St. Lawrence and landed at what is now Quebec. Here he was welcomed by the great chief Donnacona, whom he hailed as Lord of Canada. After exploring along up the river, to the lovely village of Hochelaga, under the cliffs of Mount Royal, from whose heights he saw the country for a hundred miles in all directions, he returned to France and took with him Donnacona and two other chiefs. Disease befell the poor Indians and they died in a foreign land.

The name Donnacona was but a tradition and an item of history until George McKee, busy on the plans for a newsprint mill in Canada, but with a fondness for reading history, determined to commemorate the old chief and the unhappy incident by naming his company the Donnacona Paper Company and giving the town the same name.

Now there is at Caughnawaga Reservation, near Montreal, a remnant of the Irouois Indians, to whom the first Donnacona belonged. When these red-skins heard that Mr. McKee was to be the new president of the Canadian Pulp and Paper Association, they decided to honor him by making him one of their tribe, in appreciation of his service and in recognition of his position. What more appropriate name could be given him than Donnacona — Lord of Canada? The ceremony of making an Indian of Mr. McKee took place in the Ritz Carlton Hotel, Montreal, on January 26th, after the annual luncheon of the Canadian Pulp and Paper Association.

At the conclusion of the lunch, Mr. P. B. Wilson, retiring President addressed the guests as follows:—

"Gentlemen, you will be surprised to see me presiding at this luncheon, but the Committee have made an alteration in the arrangements heretofore prevailing and have asked me to undertake this very pleasant duty. Mr. McKee, the new President, will come before you a little later in the proceedings. However, some close personal friends of Mr. McKee heard of his election to this most honourable post and are here..."

At this point the remarks of Mr. Wilson were interrupted by the wild war whoops of a troop of Indian braves who, under the leadership of their Chief, Two Axes, advanced rapidly and took up a position behind the head table. When the guests had regained their composure, the Chief addressed them in his native tongue. His speech was interpreted by Mr. H. G. Munro, as follows:—

"Now, I shall interpret for you what my brother, Chief Two Axes, the great war chief of the Iroquois, has said. He asks forgiveness for having broken into your Council Hall in such a boisterous and unceremonious manner. Last night, as he sat at his camp fire, he was visited by the spirit of the great Chief Donnacona who departed for the happy hunting ground many years ago. Chief Donnacona told Chief Two Axes that he was to gather together all the youths of his tribe and come here to-day where he would find a great Pale Face, Mr. George McKee. He stated that Mr. McKee had done much to perpetuate the name of Donnacona and, in order that the great name might be long remembered, he was to adopt Mr. McGee as a member of the Iroquois tribe, to place upon his shoulders the mantle of a Chief, crown him with the head gear of a warrior and proclaim him to the four winds of the earth as Donnacona, Chief of the Iroquois."

The ceremony which followed was watched with interest, bewilderment, and not a little amusement by the company. Mr. McKee, seated on the platform, was encircled by the youthful braves who moved around him, first at a deliberate pace, and then with constantly increasing speed until the movement became a wild and frenzied dance accompanied by blood-curdling shrieks and the brandishing of tomahawks. Then the pipe of peace was brought forth and passed around, each member of the tribe proclaiming Donnacona to the four winds. This was followed by more dancing in which the new Chief showed remarkable aptitude. The investiture then took place. Chief Two Axes placed about the shoulders of Donnacona the gaily coloured blanket of a chief and produced the feathered head gear of his rank. Attached to it were six ribbons signifying the tribes of the Iroquois Nation. To Mr. McKee was assigned the distinction of admission to the Mohawk Tribe. More dancing brought the novel and interesting ceremony to an end and the modern Chief Donnacona was acclaimed with a salvo of applause.

REID INTERESTS DROP ENTERPRISE.

ST. JOHN'S N. F., March 15—The Colonial Legislature has been notified by the premier of withdrawal by the Reid-Newfoundland Railway Company of its proposition for extensive water power development and establishment of paper making and other industries along the Humber river, on the west coast of Newfoundland. The proposition, in which an English firm also was interested, called for government guarantee of certain securities.

TIMBER IN THE NORTHWEST TERRITORIES.

The increasing penetration of agricultural settlement, the extension of the trapping field, and perhaps above all the discovery of oil and valuable minerals in the area, inducing more exhaustive exploration, have made the sub-Arctic north of Canada more generally known and have revealed resources not previously known or widened the limited knowledge as to their extent. One of the resources of this great area of which little is generally known is its timber wealth. This, according to the **Canadian Forestry Magazine**, is sufficient to supply the country for a number of years. Up to well within the Arctic circle, where they dwindle in size, are to be found quantities of spruce, tamarac, jackpine, poplar, larch, birch and willow, all of good size and in commercial quantities.

In the Mackenzie district, white and black spruce attain a height of eighty to one hundred feet, and in a majority of cases these are straight and furnish at least two logs to a tree of good size. Below Fort Smith during the summer of 1921, in an area of about a square mile, two hundred logs were cut, averaging forty feet long and ten to eighteen inches in diameter. Spruce is found in scattered groups, but the clumps are generally large, annual rings numbering one hundred being quite common. White spruce attains its full size in the valleys especially. The lower half of the Slave River is thickly wooded in this respect.

Great Areas of Jackpine.

In view of the mooted schemes of utilizing the Jackpine for the manufacture of paper pulp, the resources of this tree in the Northwest Territories are interesting as adding substantially to the valuable resources of pulpwood in the provinces to the south. The Jackpine is very prolific in this area and entire blocks of it are to be found in the Mackenzie district. When the Prairie Provinces are called upon to supply pulpwood for Canadian paper production, this northern section will be in a position to supplement the supply.

The principal tree encountered is the poplar, which constitutes entire forests in many sections of the Territories and is found elsewhere in conjunction with other trees. The balsam poplar inhabits the entire length of the Mackenzie waterways, assuming its greatest size on the Athabasca, Slave, Peace and Laird rivers. As this is the tree consisting the Prairie Provience to settlement and industrial enterprise, but, if addition will some day have value. At present it is used extensively in the building of log dwellings, and is admirably adapted for fuel.

Another tree of the region of considerable present economic value is the tamarac, which is found in the swamps and muskegs and is used extensively in the keels of boats, etc. Hardwoods are extremely scarce in the Territories with the exception of birch which is found fairly generally.

Exploration of the north has dispelled another illusion, that of a treeless desert. Not only is the valuable timber supply this region possesses of present convenience to settlement and indutrial enterprise, but, it protected adequately, constitutes a rich reserve against the time when the demand for more raw material for paper manufacture takes manufacturers to the West.

The child is in the market-place, and the dealers in alcoholic liquors are bidding for him. Stop this auctioneering, for their own and the mothers' sakes.

Washington as a Source of Pulwood

By ANDREW LIND,
(From the University of Washington Forest Club Annual.)

A nation now dependent upon foreign countries for two-thirds of its pulp supply and rapidly approaching a state of actual paper famine — it is in a condition of affairs such as this that the State of Washington, with its stand of 75,000,000 feet of available pulp material, takes an interesting and highly important position. Up to the present time very little authentic information has been gathered as to the possibilities of this State as a pulp producing region. The writer has therefore made an attempt to gather and correlate the facts concerning the actual pulp supply in the United States as well as the stand and pulp possibilities of Washington, with a view toward directing the attention of the public to the opportunity that beckons the investor in the Northwest.

General Pulp Situation of the Country.

The United States is today facing one of its most serious situations with regard to its supply of pulp and paper. Our virgin stands of pulp wood, as well as saw timber, previously considered quite sufficient to meet the demands for many years to come, have been found to be disappearing at an alarming rate. The demand for newsprint paper, especially, has been increasing by leaps and bounds. In 1899, our consumption amounted to 569,000 tons. In 1918, it had reached 1,760,000 tons, an increase of approximately 200 per cent. Per capita consumption of 3 pounds per person in 1880 had increased to 33 pounds per person in 1919. With an increase of 1100 per cent. in 40 years, the drain on our forests was bound to be excessive.

According to former Secretary of Agriculture E. T. Meredith, in less than 20 years 95 per cent. of the pulp and paper mills of the country, mainly those of the East, will have practically exhausted their supplies of spruce, hemlock and fir, the principal woods used in the manufacture of paper. At the present rate of cutting the supply of these woods will last 17 years in the New England States, 10 years in the Middle Atlantic States, and 18 years in the Lake States. Only in Alaska and the Far West are there stands of pulp wood sufficient to meet the present demands of 2,218,000 cords a year for any extended period of time. What are the possibilities of the State of Washington in meeting these demands?

TABLE I.

GENERAL SURVEY OF THE TIMBER SUPPLY OF THE STATE OF WASHINGTON.

1910 figures on the ownership and amount of the stands of the state are as follows:

	Amt. M Ft. B. M.	Area Timbered Acres
In Private Ownership:		
West of the Cascades . .	181,514,660	4,337,786
East of the Cascades . .	12,101,776	1,685,161
On lands not assessed as timber lands	10,000,000	....
Total in private ownership	203,616,436	6,022,947
Owned by Federal Government:		
National Forests . . .	81,492,000	7,600,000
Indian Reservations . .	6,100,000	1,694,000
National Parks	1,475,000	126,720
Military Reservations . .	75,000	13,961
Unreserved Public Lands	672,000	84,000
Owned by the State . . .	37,000,000	....
Tot. owned by Fed. Gov.	89,814,000	9,518,701
Grand Total	330,430,436	15,541,648

Estimating the annual cut of the State as 5,000,000. feet, the total stand for the State at the present time is approximately 280,415,000 M feet B. M.

Application to the Pulp Industry.

The State of Washington has a larger and better stand of paper wood than any other region of the same area in the United States. A conservative estimate of the U. S. Forest Service places the stand of pulp wood in the State at 75 bilion feet,consisting of hemlock, spruce, and silver fir. Considering this entire amount to be used exclusively for the newsprint pulp industry, Washington has sufficient material to insure a perpetual supply of one-half the present newsprint requirements of the United States. The full force of this fact is realized when we remind ourselves that this country is now dependent upon Canada for two-thirds of its pulp supply, an item amounting to approximately $72,000,000 annually.

It is undoubtedly true that about 40 per cent of the upper grades of the pulp material can be more advantageously sold on the market as lumber but this loss would probably be more than compensated for by the use of waste made possible through improved utilization when the pulp industry becomes established in Washington.

The State is now cutting annually 460 million feet of hemlock, spruce and silver fir, the greater part of which is much better adapted to use as pulp than as lumber. This amount is equivalent to 766,000 cords—sufficient to fully supply ten 200-ton daily capacity pulp and paper plants. Granting 40 per cent of this amount as being best suited for lumber, there would still remain 466,000 cords, or sufficient to supply six plants with a daily capacity of 200 tons. This venture into the pulp industry is both possible and practicable at the present time; and seven plants have already entered the field on a small scale and have found it a paying proposition. Practically 600 tons of paper of one kind or another is being manufactured daily in Washington at the present time.

THE SOURCES OF PULP WOOD WITHIN THE STATE OF WASHINGTON.

I. The Olympic Peninsula.

What is considered the best pulp region in Western United States, exclusive of Alaska, is comprised in the areas drained by the eight following named streams located on the west slope of the Olympic Mountains. The combined mixture of hemlock, spruce and silver fir, both inside and outside of the Olympic National Forest on these streams and on adjacent areas to the northwest, ranges from 70 to 80 per cent, and the area carries the enormous stand of 41 billion feet B. M. The total stand of all species on the Olympic Peninsula, private, state and national, is estimated to be 70 billion feet, of which 38 billion consists of pulp material.

With this enormous stand of first class pulp material still untouched, unlimited water power resources, and excellent opportunities for manufacture and shipment from either Port Angeles or the Harbor, this region is surely destined to take a very prominent place in the development of the pulp industry in this country.

EIGHT OF THE BEST PULP WOOD CHANCES IN THE UNITED STATES.

River	Hemlock M Ft. B.M.	%	Silver Fir M Ft. B.M.	%	Sitka Spruce M Ft. B.M.	%	Total Stand Pulp Wood M Ft. B.M.
Humptulips	740,000	40	720,000	39	55,000	3	1,535,500
Quinalt	1,360,000	40	1,504,000	31	170,000	5	2,584,000
Queets	1,430,000	40	622,000	20	186,000	6	2,239,000
Clearwater	1,000,000	40	750,000	30	225,000	9	1,975,000
Hoh	1,120,000	28	800,000	20	440,000	11	2,340,000
Bogacheil	1,380,000	46	540,000	18	150,000	5	2,070,000
Colawah	1,224,000	51	744,000	31	48,000	2	2,016,000
Solduc	504,000	35	360,000	25	14,400	1	878,000
Totals	18,758,000		5,590,000		1,308,400		15,638,000
Privately owned pulpwood outside and adjacent to the National Forest							20,000,000

2. The Region East of Puget Sound.

Although the region on the Olympic Peninsula mentioned contains the best stands of pulp wood in the State, there are excellent opportunities in the region east of Puget Sound for the pulp industry, as regards stand, water power, clear water and suitable location. Everett is admirably located in regards to the proximity of the raw material, and lines of transportation, both land and water, to economically handle the wood produced east of the Sound. The following tables will give a fair idea of the stands of pulp wood in the valleys best adapted to the production of pulp.

WASHINGTON NATIONAL FOREST.

	M Ft. B.M. Total	Pulp Stand M Ft. B.M. Hemlock	M Ft. B.M. Silver Fir
North Fork Nooksack.	334,000	304,000	638,000
Canyon Creek	88,000	76,000	164,000
Chilliwack	79,000	79,000	158,000
Middle and South Fork Nooksack	109,000	205,000	314,000
Baker River	286,000	445,000	731,000
Suiattle	517,000	517,000	1,034,000

SNOQUALMIE NATIONAL FOREST.

Sauk	616,000	330,000	946,000
Stilaguamish	514,000	468,500	982,500
Sultan and Pilchuck .	21,000	14,000	35,000
Beckler	120,000	100,000	220,000
Skykomish	390,000	255,000	*645,000
Snoqualmie	185,500	118,000	*303,500
Cedar	44,000	44,000	* 88,000
Green	40,000	30,000	* 70,000

RAINIER NATIONAL FOREST.

White	258,000	128,000	386,000
Puyallup	27,000	13,000	50,000

Although the whole amount of spruce, hemlock and silver fir cut in this region would be available to pulp mills located on Grays Harbor or Puget Sound, it would not be desirable or practicable for the better grades of either spruce or hemlock to be utilized in the manufacture of paper. Indications are, however, that about 60 per cent of the lower grades of hemlock and spruce logs which are now forced on a non-receptive market, could far more economically be utilized in the manufacture of paper. This, under present conditions, would amount to about 417,000 cords of pulp species, sufficient to supply five 200-ton plants.

This amount of available pulp wood will be immensely increased from two positive sources, when a market is created.

First: Due to wasteful methods in logging at the present time, it is estimated that in the forests of Western Washington only 25 per cent of the tree is ever utilized as lumber. Thirty-five per cent. of the tree is left to rot in the forest. Furthermore, it is the practice to take only trees of a fair size. It is estimated by Forest Service officials that about 2,000 board feet per acre of good, sound pulp material could be obtained after the average logger has left a region.

Second: As the pulp industry become firmly established in the region, closer utilization of waste will be made in the saw mill. According to statistics compiled by Professor Burt. P. Kirkland in the 1920 Forest Club Annual, about 35 per cent. of the tree is lost at the mill in slabs and edgings, sawdust, and shavings. A large part of this will undoubtedly be utilized in the manufacture of pulp when it becomes practical for the operator to keep them.

Conclusion.

Available information shows that under present conditions, without breaking in on the supply of lumber for the general market, but merely taking a product that is at present wholly lost or which can be more advantageously utilized, there is sufficient pulp wood in the Grays Harbor-Puget Sound Region to produce 300,000 tons annually for an indefinite period. The Olympic Peninsula alone can support four or five large sized plants indefinitely, providing the forests are put on a sustained yield basis. The fact that the *State of Washington* must take a very prominent place in the development of the pulp industry in this country is not yet fully realized. However, it will be but a matter of a few years until the nation must look to this state for a large proportion of its pulp and paper.

Note—The statistics and data quoted in the above article have been obtained from the Capper Report, the 1920 Forest Club Annual at the University of Washington, the January, 1920, issue of the American Forestry Magazine, the U. S. Forest Service Report on Timber Depletion in the United States, the 1910 Census Reports of the United States Bureau of Census, and an unpublished report by W. G. Weigle, District Forest Inspector, District 6 of the U. S. Forest Service.

PAPER CLUB AT McGILL.

The students at McGill University, interested in the Pulp and Paper industry, have formed a Pulp and Paper Club. About twenty members are already enrolled. Mr. A. L. Dawe, of the Canadian Export Paper Co., was elected honorary president; W. C. Munro was elected to the position of president, and F. W. Bradshaw to that of vice-president. Both these men are in the Faculty of Applied Science. F. W. McCrae, of Commerce, was appointed secretary-treasurer.

Mr. Munro emphasized the advantages of becoming student members of the Technical Section of the Pulp and Paper Association.

A WHITE FIR VOLUME TABLE.

The Agricultural Experiment Station at Berkely, Cal., has issued a table for estimating the volume in board feet of White Fir (**Abies concolor.**) This is Bulletin No. 329, by Donald Bruce.

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* Within the Northern Pacific Railroad grant; hence the total stand within these watersheds is about twice what is shown.

Proceedings of the Technical Section.

(continued from last issue.)

ERRATA.

The following corrections should be made in the article **"The Use of Clean Water as a preservative for Storing Mechanical Pulp,"** in the Pulp and Paper Magazine, Jan. 26, page 64, and in the reprint of same.

Page 64, Column 2. In the last paragraph the **First line** should be "In November 1921, seventeen months after the pulp." Note that the second line was repeated.

Page 65, Column 1. In the paragraph Disintegration the word disintegration is misspelled in the first line,—it is spelled with an e.

Page 65, Column 2. Two sentences should follow 'allowed to drain'right above the chart. These sentences are:

"Only the flow from the side discharge was meas-"ured and its volume in cubic centimeters read di-"rectly as freeness. The flow from the bottom dis-"charge was retained for use in making the test sheets.

Page 66. Column 1. 3rd paragraph.

The ninth line following "The whole was then" should be "transferred to a hand letter-press and pressed for three."

This line was omitted altogether.

DISCUSSION OF PAPERS.

The Use of Fuel Oil.

Mr. T. R. REMSEN; St. Maurice Lumber Company, printed in the Pulp and Paper Magazine, Jan. 19, 1922. published in the Pulp and Paper Magazine, Jan. 26.)

(Take in paper by T. S. Remsen on "The Use of Fuel Oil.")

Mr.CARRUTHERS: Thank you, Mr. Remsen. Are there any questions to be asked?

Mr. WARDLE: I think we have all been very interested in Mr. Remsen's paper.

Powdered Coal as Fuel in Steam Plants.

Mr. HENRY KREISINGER, Research Engineer for the Combustion Engineering Corporation, New York, read a paper on "Burning Pulverized Coal under Power Plant Boilers" prepared by himself in collaboration with Mr. John Blizard, Fuel Engineer, United States Bureau of Mines. He said: Gentlemen, the subject of my paper is "The Burning of Pulverized Coal under Power Plant Boilers." The paper is based on experimental work and on three series of tests, that have been made at three different plants by the Research Department of the Combustion Engineering Corporation in cooperation with the United States Bureau of Mines. The work has been strictly according to rules and the facts are as they are presented.

(Here Mr. Kreisinger read his paper, which was published in the Pulp and Paper Magazine, Jan

Note:—Several typographical errors in Mr. Remsen's paper will be corrected when it is reprinted.—Ed.

The charts, tables and figures illustrating the paper were thrown upon the screen and explained in detail by Mr. Kreisinger.

Mr. CARRUTHERS: I am sure we are all very grateful to Mr. Kreisinger for his comprehensive paper on Powdered Coal Combustion. Are there any questions to be asked in this connection?

Mr. MASON: I wonder if Mr. Kreisinger will tell us something about the storage of pulverized coal and whether there is any danger attendant upon it.

Mr. KREISINGER: There are probably two dangers. One is the spontaneous combustion of coal in the bin and the other is the explosion of coal dust that we have heard so much about. I have never seen a coal dust explosion. Coal is not like powder, as some people may believe that will burn if a match is touched to it. You can put a burning stick right into powdered coal pit and the coal will not burn. Coal has to be mixed with air and held in suspension before it will burn. It will not explode with the violence of gun powder; but will burn with a sluggish flame. Coal has to get oxygen from the air, whereas gun powder has oxygen mixed right with it so does not need to get it from the atmospheric air. You can find how difficult it is to ignite coal when you try to do it in a furnace. You can light it with a torch but unless you do it properly you may have some difficulty in igniting it, although, if you have a proper torch, you will not have very much trouble in lighting the coal. I would rather light a powdered coal fire than an oil fire.

As to the spontaneous combustion, you should avoid storing powdered coal. It is not a good thing for the coal. If the coal contains any moisture it may cake, and when you are ready to use it, it will not flow into the furnace in a uniform steam, but will drop in pieces about the size of a pea. Undried coal should be pulverized two or three hours before it is to be used in order to get away from caking trouble. Spontaneous ignition should not give any trouble unless the coal comes hot from the dryer and is stored more than two or three days in a bin. I do not say it will ignite every time, but it may do so. I have seen it start spontaneous ignition during these tests that we have made. We have weighed the powdered coal as it was supplied to the feeder. The coal was warm when it was coming from the pulverizers. The coal weighing tanks were of sheet iron. The walls of the tanks chilled the coal and caused condensation of moisture on the inside of the walls of the tank. This condensation made the coal stick to the tanks so that we had to hammer them to make the coal come out. In order to prevent the condensation we covered the tank with hair felt. Some coal dust got into the hair felt and in two or three days the hair felt caught fire. It was a smothering fire and no explosion. To avoid heating or spontaneous combustion in the bin do not store pulverized coal for any length of time but pulverize it a few hours before you need it.

Mr. WARDLE: I would like to ask if Mr. Kreisinger considers it essential to dry the coal? I notice that the last slide did not show any advantage in efficiency from using dry coal as against undried. Have you considered whether it would be possible to take coal mixed with snow, frost and ice, pulverize it and feed it into the furnace?

Mr. KREISINGER: Moisture does not present any difficulty in burning pulverized coal. The efficiency is about the same with dried as with undried coal, but more power has to be used to pulverize undried coal. It does not break up so easily; it is tougher. If undried pulverized coal is put into the bin and let stay there it may cake, and stick in the screw feeder. We ran the plant at Rivermines for four days with undried coal and did not have any trouble from that source. However, we used the coal within five hours after it was pulverized. Any increase in the efficiency due to using undried coal would be mainly due to the saving of the coal burned to treat the dryer. However, the saving thus made would nearly be offset by the increase in the power required to pulverize the coal. The difficulty in using undried coal is not in burning the coal but in moving it by conveyers. If the system is properly desigued, coal can be used efficiently. Design the plant so that pulverized coal does not need to be moved by conveyors.

Put the air separation system above the bin and let the coal come down into the feeder bin by gravity. The only place where the coal may stick is in the feeders. This sticking can be avoided if the air supplied with the coal through the feeders is preheated to 150 degrees.

Mr. HAZEN: I am sure we have all listened with a great deal of interest to Mr. Kreisinger's paper. I should like a little more information in regard to the question: "Was this moisture in the Illinois coal to which Mr. Kresinger has referred moisture, or water of composition?"

I noted with a great deal of interest the slide showing the combustion space. It is enormous in comparison with the size of the boiler and as we usually regard combustion space. I imagine that rather effectively closes the question of the use of powdered fuel for locomotives. Of course, that does not interest the paper section, but it has a connection with the question of fuel economy.

Another point I was very much interested in was the condition of the water coils at the bottom of the furnace. I was wondering how you would avoid having these coils coated with scale in case you had hard water to contend with.

Mr. KREISINGER: The first question mentioned is that of moisture. We have the Chemist's definition of moisture. He takes the coal sample, puts it in air which is previously dried by bubbling through sulphuric acid. The air is held at 105 degrees centigrade, and the coal is kept in the air until it comes to a constant weight. That is the moisture we speak about when we use the word "moisture." People will speak of inherent moisture and surface moisture but these moistures are hard to define and difficult to determine. The moisture that is an obstruction to the pulverization of coal is the moisture that makes coal wet. Illinois coal with 8 per cent moisture will look dry. Take Pocahontas coal with the same percentage of moisture and you can make balls with it. George's creek steam coal with seven per cent moisture will be wet. The best definition of troublesome moisture is the one that makes the coal wet.

You can take your Canadian lignite of Saskatchewan, which has some 35 to 40 per cent of moisture, drive off about 15 per cent, reduce the moisture to 20 per cent and you can pulverize and burn that coal very well. If you have 20 per cent of moisture in Illinois coal it would give you a lot of trouble.

Mr. HAZEN: It is inherent moisture that you have in the Illinois coal?

Mr. KREISINGER: It is largely the inherent and some surface moisture.

Mr. HAZEN: I notice that in the test you showed eight per cent of moisture.

Mr. KREISINGER: That was as the coal came from the mines; it was not dried. In the dried coal tests the moisture was not very much lower — about three per cent on the average — the coal was dried just enough to drive off the surface moisture. That is all that it is necessary to accomplish in drying the coal. In the old days it used to be stated that you had to have coal dried down below one per cent. Nobody thinks that is necessary now. They used to tell us also that we should have the coal pulverized to a fineness of 85 per cent through a 200 mesh screen. That is past history too.

You mentioned the combustion space. You can burn about two pounds per cubic foot of space per hour. The speaker before me (Mr. Remsen) gave the rate of combustion as from three to four pounds of oil per hour per cubic foot of furnace space but he is using oil which can be broken up finer than solid coal. Today we are still at the dawn of the era of burning pulverized coal. In future we shall be able to burn coal at higher rates per cubic foot or combustion space. It may only be a question of time when we shall get up to 10 pounds because it is done today to some extent in locomotives although we cannot explain how it is done or with what efficiency. I know that there are some people of the opinion that we cannot burn pulverized coal in locomotives. But there are some locomotives running with powdered coal in Brazil and Japan. Of course, some of he unburned carbon is blown off through the stack, but in using run-of-mine, or crushed coal, the cinder losses are very high and usually run from 15 to 20 per cent. Powdered coal, in that respect, is not any worse than run-of-mine or crushed coal. We shall gradually find out how it is done and in future we may be able to give you a furnace which will burn powdered coal at high rates.

Your last question whether the water screen becomes stopped by scale. So far we have not had any trouble from that cause. Some of them have been used since April with Lake Michigan water. They used condensed water but the condensed was too clean and they could not keep the boilers tight. They mixed the condensed water with the ordinary lake water and in this way they have got over the trouble from leakage. They have no trouble from scale. Suppose the coil does get scaled up; what do you do when you get your boiler scaled up? What do you do when you get your first row of tubes over the fire scaled up? You take your turbine, run it through and clean up the scales. There is no more difficulty in cleaning the water screen than in cleaning the boiler. The screen is designed so that you get definite results from it. It has a very efficient heating-up surface. It produces a boiler horse power on less than one square foot of heating surface.

Mr. WARDLE: When we were looking at the longitudinal section of the furnace, you told us that it had a combustion space of 7,200 cubic feet. I did not get the rating of the boiler.

Mr. KREISINGER: That is the combustion space underneath the boiler including all the space below the water screen. The rating of the boiler is 1,338. That includes the heating surface in the screen. The boiler alone has about 1306 sq. ft. The screen adds 320 square feet and develops about 400 horse power. The boiler, including the water screen has 13,380 square feet of heating surface.

Mr. F. J. FISHER: I would like to ask the speaker what proportion of the horse power developed in the boiler was used to pulverize the coal.

Mr. KREISINGER: When the coal is reasonably dry, it takes about 14 kilowatt hours to pulverize one ton of coal and that to run the dryer it will take one and three quarter kilowatt hours to dry one ton of coal. About 25 pounds of coal is burned in the dryer per ton of coal dried. If you are buying your power to pulverize coal you can figure out how much it will cost. If you make a kilowatt hour equal to two pounds of coal and it takes fourteen kilowatt hours to pulverize a ton of coal, that is 28 pounds of coal used to pulverize a ton. Then you get an addition of about 3 1-2 pounds used in power to dry it. That is about 32 pounds. Then you use 25 pounds to dry it. That is on the assumption that it takes two pounds of coal to produce a kilowatt hour. That is about 57 pounds per ton. Fifty-seven pounds, or less than three per cent. You could cut out your dryer and eliminate the 25 pounds for drying, and then you have 32 pounds which is about 1 1-2 per cent. If you want to figure back the net efficiency deduct about 2 or 2 1-2 per cent from the efficiency I have given you. Of course, that depends again on the size of the plant. With a large plant you can get lower figures for the preparation of coal and with a small plant higher figures.

Mr. BEIQUE: I would like to ask Mr. Kreisinger if he would recommend running a preparation plant twenty-four hours a day, or would he favor running a plant ten hours a day? In the latter event would he be able to store the balance of his coal for the night?

Mr. KREISINGER: In a small plant you might do that, but it would pay you to get a little larger preparation plant, run it for eight hours and in that eight hours pulverize all your coal for the succeeding twenty-four hours. I do not think you will have any trouble from caking or from spontaneous ignition or combustion. That would really be the most economical operation. The extra mill will cost somewhere about $6,000 or $7,000 and the extra man will cost about $1,000. If you put in an extra mill you save about $1,000, but to get that saving you have to make an additional investment of about $7,000.

Mr. BEARCE: Is the ash completely fused or does some of it go out through the flue?

Mr. KREISINGER: We have burned Pittsburg coal and Illinois coal and with both coals the ash fused completely. While in the molten state the ash particles form minute globules that float in the gases. About one third of the ash is deposited at the bottom of the furnace. It solidifies as it passes through the water screen, and is deposited in granular form and can be removed easily. The remainder of the ash floats with the gases through the boiler and is partly deposited in the flues and partly passes out through the chimney.

Mr. NEILSON: At the plant of the Belgian Industrial Company we have been considerably interested in the question of using pulverized fuel. Of course, as Mr. Kreisinger said, events are developing very rapidly in this field and the information we have collected may be somewhat old fashioned. It is about six months old. We found from getting in touch with a number of firms selling this equipment, and also with plants which are using pulverized fuel, that the biggest problem is the question of combustion space. After considerable information had been gathered we put the question up to the pulverized fuel people if the present plant using stokers could be equipped for burning pulverized fuel and the results guaranteed, and we could not get any answer to the question, probably owing to the fact that we told them that we would not consider raising the boilers about sixteen feet high or digging into the ground about ten feet deep. The question of combustion space is a difficult one for plants already in existence. Furthermore, the cost of equipment seems at the present time very high. The best figure we could get at that time was about $62 per horse power which is very much higher than that of any stoker-equipped boiler. In regard to the cost of pulverizing; Mr. Kreisinger says that the cost will be anywhere from 25 cents to $1 per ton. Based on present wages and on two or three plants in the United States where they are actually using pulverized fuel now, one of them being a big steel plant, we came to the conclusion that it would cost $1.10 per ton. Of course, wages have been reduced somewhat and as a result the figure we have at present is about 92 cents per ton. If you put the price of coal at $8 and the cost of delivering the coal at the boiler plant for stoker firing at about 15 cents, which is the actual average of a great many American and Canadian paper mills reporting costs to-day, you will have $8.92 for pulverized fuel against $8.15 for the stoker-fed plant, which difference has to be absorbed in the increased efficiency of the pulverized fuel burning plant. As to the operating efficiency of pulverized fuel burning, not test efficiency during a limited period, but actual operating efficiency, the best figure we could get was about 78 per cent. I think that checks up pretty well with the tests which Mr. Kreisinger has. Against that figure we can obtain an operating efficiency for the stoker-fed plant at the present time of at least 72 per cent. Some of the plants which have modern underfeed stokers are getting two or three per cent over that, but we may estimate 72 per cent efficiency for stoker plants and 78 per cent efficiency for pulverized fuel plants. Based on the wages of today, we then get a total cost per thousand pounds of steam, for the pulverized fuel burning plants of 44.2 cents and for the stoker fired boiler of 46.8 cents. On this basis there is a difference of $0.026 per 1000 lbs. in favor of the pulverized fuel burning plant, admittedly not a very large saving.

Mr. KREISINGER: There is very little data available for comparison between the cost of operation of the stoker plant and the pulverized coal plant. A great many people charge the pulverized coal plant with all the operating cost, but do not charge the stoker plant with all its operating costs. They say that the stoker does not require any power to operate it. But if the boilers are operated at 200 per cent rating, the power required to supply the air for underfeed stokers is about equal to the power required to pulverize the coal in a pulverized coal plant. If you wish to make a comparison that will have any value charge all the cost to the stoker-fired plant as well as charging all costs to the pulverized coal plant.

Mr. FISHER: There is another point I want to make. Twelve or fourteen years ago there was a powdered fuel plant of about 1,600 horse power installed in Canada, and I had the opportunity of visiting that plant several times after it had been placed in operation. In the beginning of the winter there had been a severe snowstorm, but anywhere in the vicinity of the plant you would hardly suspect that there had been any snowstorm because the snow was out of sight from what had come out of the stack of the plant. Has that trouble been eliminated?

Mr. KREISINGER: Yes, largely so. Ten or fifteen years ago you could not pass on the street or on the road without seeing an automobile and a man under it or standing around somewhere fixing or trying to start it. Today such sights are very rare. The same is true of powdered coal. People had a lot of trouble and they still have, I admit that. You can go to Milwaukee, and see Oneida Street station or the Lakeside station, and you will find that these plants look a great deal different from the plant you describe. You said that this occurred several years ago. Powdered coal has been inherited from the cement man. The cement man has a lot of dust around his plant anyhow, and he does not care if there is a little coal dust around his plant. But, when we come to a large power station, or even a small power station, they are anxious to keep their plants clean, and most of them are cleaner than stoker plants. It is not necessary to have dirt around the plant, the dirt can be avoided.

Mr. STEPHENSON: Mr. Kreisinger has referred to Milwaukee. Milwaukee is apparently famous for a number of things and one of the things that struck me when I was out there some time ago visiting some of the paper mills was that a city non-smoke ordinance was in force and the decrease in the amount of smoke which could be emitted from the chimneys was astonishing. I suppose that this instalment of the street railway power plant was somewhat in the line of keeping down the smoke nuisance.

A comparison has been made between the stoker plant and the pulverized coal plant on the basis of the steaming qualities of pulverized coal apparently. It seems to me that I have heard something, or seen something in the literature, to the effect that a much cheaper grade of coal can be used as pulverized fuel than can be efficiently used under a stoker fired boiler. Am I correct in that?

Mr. KREISINGER: I think you are right about that, but you have to consider the cost of pulverizing low grade coal. If you have a low grade coal running 40 per cent ash the heat value of such coal will be about 8000 B.T.U., you are using power on the grinding 40 per cent of ash. You have to do too much more grinding to get the same amount of heat that you would out of a good coal. The low grade coal proposition depends entirely on whether you want to spend money pulverizing large amount of ash. Of course, if you have not any other coal it may be easier to turn it into the pulverized fuel than to burn it on astoker.

Mr. STEPHENSON: The literature has also contained some references lately to the use of partly evaporated waste sulphite liquor as fuel and in some of those plants where evaporation is carried on, it is claimed that the evaporated product is in a rather powdered form although it may contain 50 per cent moisture. It has been suggested that this material might be fed into the furnace space by compressed air injection or by blowing in somewhat the same fashion as powdered coal is, or might be mixed with powdered coal. I wonder if Mr. Kreisinger's concern has had anything to do with developments along that line.

Mr. KREISINGER: No, I have had no experience myself along that line, and I do not believe that my company has. That is probably something new. I cannot say anything about it.

Mr. CARRUTHERS: Are there any other questions to ask? If there are no further questions, I may say that we have had placed on the table samples of groundwood in connection with the description of the experiments that interested us so much this morning. Mr. Blair is also here and he will explain anything that any of the members wish to konw regarding any of the samples. Inasmuch as it is getting rather late to start another paper, it would be in order for some one to move that we adjourn.

Mr. ANDERSON: I move that we adjourn.

Mr. STEPHENSON: I second the motion.

Motion (Mr. Anderson) agreed to.

The Session was concluded at 5.30 p.m.

(Discussions to be continued.)

Work on the steel construction in connection with the new bridge over the river at East Angus, Que. was started on Saturday. The work is under the control of the Mackinnon Steel Co., Ltd., of Sherbrooke.

REPORT OF THE COMMITTEE ON ABSTRACTS AND PUBLICATIONS.

The report of the Committee on Abstracts and Publications was presented as follows:

During the past year the committee has collected the material for a second volume of Proceedings and List of Members of the Technical Section; It brings the history of the section from 1918 to 1921 and presents a revised list of the members. This 72 page book is available to members on application to the secretary.

Abstracts of the literatuure have been carried on as heretofore, with co-operation of the Abstract Committee of the Technical Association of the Pulp and Paper Industry of which Mr. Ross Campbell is chairman. The staff of abstractors has been increased and the scope of work somewhat extended. The number of pages of abstracts published during the year 1921 has been considerably greater than in any previous year and these abstracts have been reprinted in the form of a bulletin and distributed by the secretary to the members of the section. A number of copies have been retained in order to provide for bound volumes for those who may desire them.

The Pulp and Paper Magazine has continued to function as the official organ of the Technical Section and has printed full reports of papers and discussions at the annual meeting, a review of the summer meeting, and a translation from Italian article on Bronzes. This translation was provided by the committee on Mechanical Standards. This article was reprinted for distribution as was the case with several other articles that appeared in the magazine during the past year. Among these might be mentioned "The Structure of Cereal Straws" by Prof. Lloyd of McGill University and three articles on "Use of Decayed Wood and the Prevention of Decay of Wood Pulp" by J. S. Bates, and an article on the "Use of Decayed Wood for the Manufacture of Soda Pulp" by E. Sutermeister.

At the time of the change of secretaries by the T. A. P. P. I. the two abstract committees made an arrangement with Mr. A. P. Couture, who has been serving on the abstract staff for the Technical Section, to prepare all the abstracts made by both committees for distribution to the various trade journals subscribing to this service. The committees plan to proceed along the same lines with hopes of giving even better service in the coming year.

Respectfully submitted,
J. N. Stephenson,
Chairman.

MR. STEPHENSON: We can add that between October 1, 1921 and January 5, 1922, there were published 16,659 abstracts of literature.

If any member of the Technical Section has not received a copy of the revised proceedings bringing the history of our section from 1918 up to 1921, and if he will advise the secretary, a copy will be sent to him.

DIVIDENDS DECLARED.

The Howard Smith Paper Co. has declared a dividend of 1½ per cent. on the common and 2 per cent. on the preferred, payable April 20 to shareholders of record April 10.

Price Bros. has declared a dividend of ½ per cent., payable April 1 to shareholders of record March 21.

Abitibi Power & Paper Co. has declared a dividend of 1¾ per cent. on preferred, payable April 1 to shareholders of March 20.

Pumps and Their Characteristics

(Continued from last issue.)

CHAPTER XI.

Methods of Testing Pumps.

It is very often necessary to make tests on pumps after they have been installed in a plant in order to determine their capacity head or efficiency and there are several methods by which this can be accomplished. For testing or checking for capacity there are several different ways in which this may be determined within very close accuracy.

1st. By placing a **water meter** or **flow meter** in the discharge line and pumping all of the water through the meter. This method is usually a permanent feature of the installation and especially in the case of general water supply pumps it is a great advantage to keep daily, weekly and longer period records of the pumpage and such meters are usually equipped with a recording device which marks off a graphic record of the quantity of water passed through the meter during a 24 hours or longer period.

Such meters as are known to be correct in their reading within a reasonable degree may be used for making pump tests for the purpose of determining the efficiency of pumps and a meter which is in good working order may be accepted as being within 5 p.c. of accuracy.

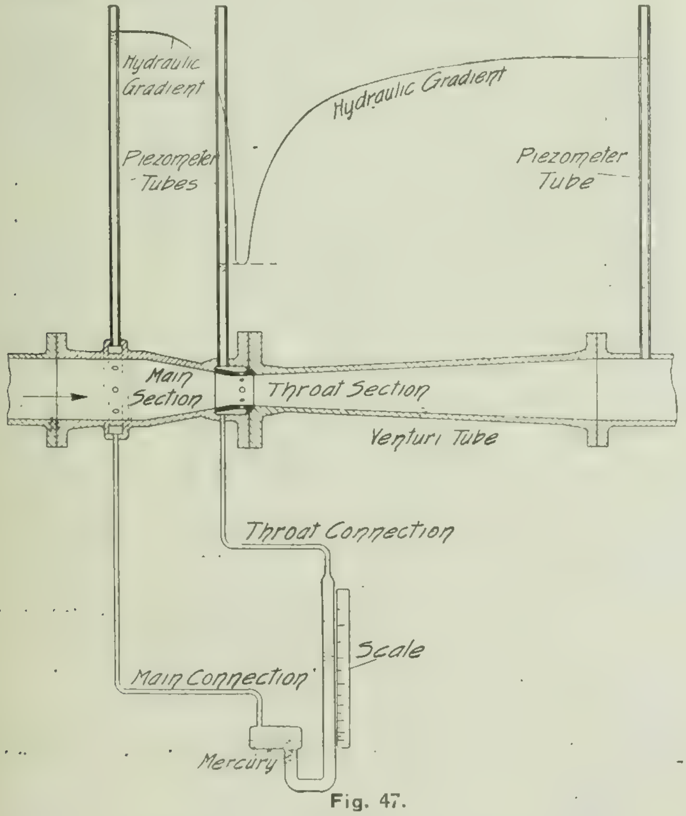


Fig. 47.

2nd. **Venturi meters** are mentionad under a spearate class from water meters and flow meters as such, for the reason that when accurate tests are essential these meters may be equipped with mercury columns or manometers. They may be depended on to obtain readings within 2 per cent of accuracy.

The Venturi meter or tube consists of a tapered or conical pipe or nozzle which is placed as a section of the discharge main of the pump.

The principle of the Venturi tube is a measurement of the difference in pressure at two points which determines the velocity of the water passing through the tube; these measurements being taken at a point on the upstream or inlet end of the the meter tube and at the short contracted section which is accurately bored to size and calibrated.

Fig. 47 shows the Venturi meter tube and connections for talking the readings which are usually registered on a mercury column but may be arranged for permanent installation, as in other meters, with recording devices. The actual instrument would be of different dimensions, and is usually introduced into a pipe line by means of a special fitting called a corporation cock.

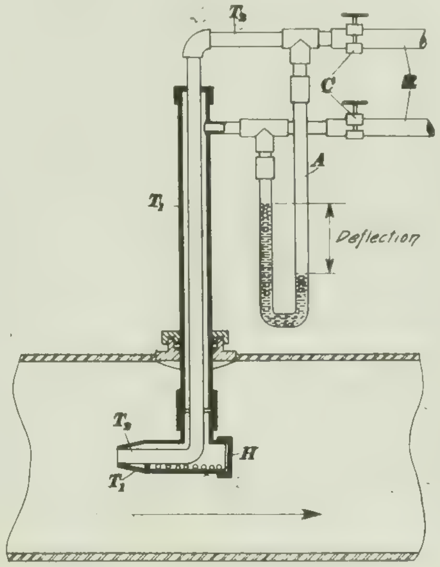


Fig. 48.

3rd. The **Pitot Tube**, consists of a double tube, one tube being within the other which is inserted into the pipe through which the water is flowing and measures its velocity. The tube enters the pipe at right angles to the flow and has a bent end with an opening to the inner tube facing the flow of the water.

The outer tube T, (fig. 48) is punctured along the horizontal piece with several small holes which permit the water to enter the outer tube and rise in the outer tube and its connections to a height equal to the static head in the water main while the water which enters the inner tube T, will rise to the same height plus the velocity head due to the rate of flow through the main.

Therefore the outer and inner tubes are connected with pipes or rubber tubes to the two legs of a U tube A, partially filled with mercury or suitable liquid and as the pipe connected to the inner tube is subject to the static head plus the velocity head this excess head over the head to which the outer tube is subjected, will cause a deflection of the mercury column equal to the velocity of flow in the main.

Fig. 48 shows the Pitot tube inserted in a water main with connecting tubes and U tube for reading the velocity. In using the Pitot tube it is essential that all air should be worked out of the measuring tubes in order to obtain accurate results. R is a rubber tube and C a pinch cock for releasing air.

It is customary to take readings at different points across the water main in order to determine the rate of flow which is the average for the pipe and from these readings a coefficient may be developed after which test readings may be taken with the upstream opening located in the center of the water main and the coefficient applied to the readings thus obtained.

4th. **The weir.** In measuring water by means of a weir it is necessary to discharge it into an open stream and the weir or notch through which the flow is measured partially dams the streams so as to control the water and pass it all through the weir notch.

The weir measurement of water is based on the velocity of flow through the notch of a known width and the depth of the water flowing over the lower edge of the weir notch should be measured either by a stake with a zero at the same elevation as the lower edge of the weir and graduated scale above the zero or by means of a hook gauge which should also be set with its zero at the lower edge of the weir.

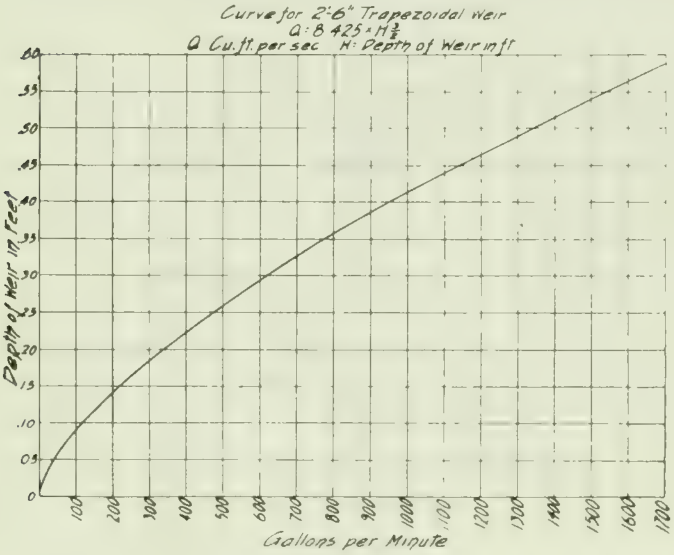


Fig. 49.

The weir is a very convenient method of measuring moderate to large volumes of water when it can be carried through an open passage or flume so as to form a weir box with the notch at one end, and sufficient drop to the water flowing over the edge of the weir so as to permit air under the water fall.

The formulas for their measurements are based on extensive experiments in the flow of water through streams and open flumes or canals.

Figs. 49-50 illustrate curves for flow of water through a trapezoidal weir having a width of 2'-6'' on the base line and the sides at an angle of 15° from the vertical.

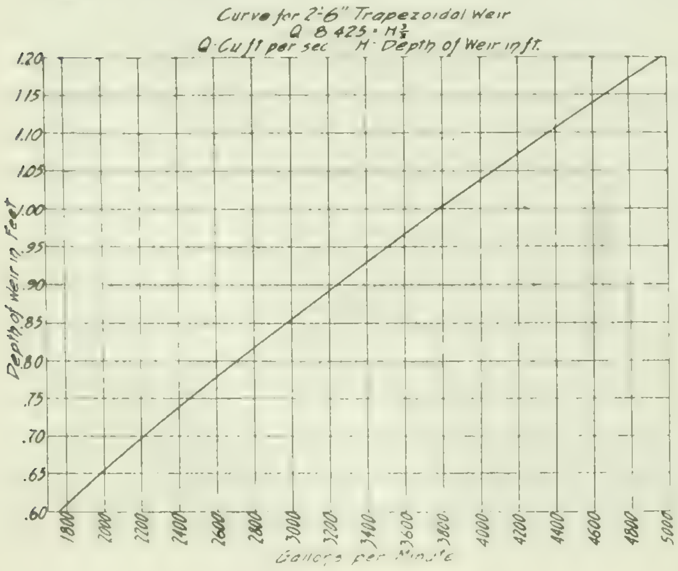


Fig. 50.

Fig. 51 illustrates flow through a weir 4'-0'' wide on the base line with sides at right angles to the base line.

In order to measure the depth of flow over the weir accurately, the stake or hook gauge should be located about three times the width of the weir notch on the upstream side of the weir.

5th. **The nozzle:** This is often a very convenient method of measuring the flow of water and smooth bore nozzles which are accurately machined to micrometers will assure a high degree of efficiency.

The flow through the nozzle is proportional to the square root of the head at the nozzle in feet and to the area of the nozzle at the outlet.

In order to reduce the calculated result for nozzle flow to the convenient terms of U.S. gallons per minute a constant has been deduced which will apply to all measurements of water through nozzles and orifices when used in connection with the proper variables. The method of calculating the flow through nozzles and orifices is as follows:—

C = which has just been referred to = 24.96.

$C \times Y \times A \times \sqrt{H}$ = Gallons per minute.

Y = Coefficient of nozzle efficiency.

A = Area of nozzle or orifice in square inches.

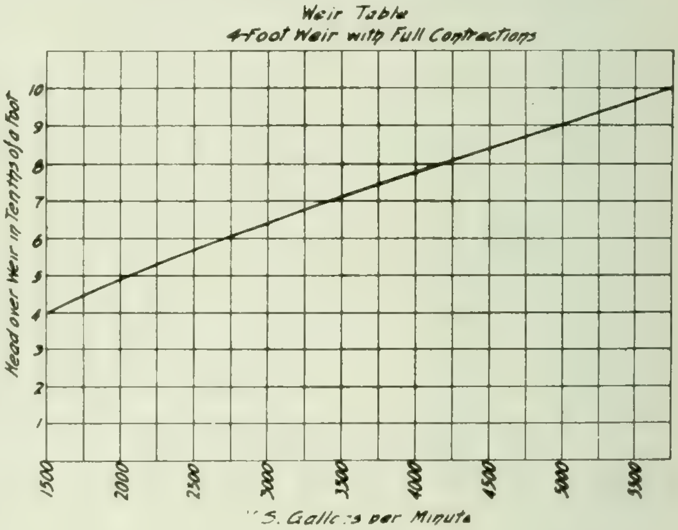


Fig. 51.

$\sqrt{H}$ = Square root of the head in feet at the point of discharge of the nozzle or orifice.

Y may be taken as follows:—

For smooth bore nozzles, carrefully machined as to area but not extra smooth in bore .95.

For smooth bore nozzles, carefully machined as to bore .98.

For ring nozzles .80.

For orifices through metal plates with sharpened edges .62.

Example:—

To calculate the flow through a smooth bore nozzle carefully machined and smooth 4'' in diameter under a head of 25 feet.

Area of 4'' circle = 12.36 sq. in.

Square root of 25 = 5.

Coefficent = .98.

Therefore:—

24.96 x .98 x 12.36 x 5 = 1512 G.P.M.

Displacement: This method may be used for measuring pump capacities whenever circumstances will permit and there is no more accurate or convenient way of measuring water.

Any tank or vessel in which the water can be measured is suitable for pumping into or out of and the time taken to fill or empty the tank as the case may be, should be carefully recorded in order to measure the rate of flow through the pump.

In testing displacement pumps of the piston or plunger type the capacity may be measured by counting the number of strokes or revolutions per minute and calculating the G. P. M. according to the method described in the chapter on steam pumps. This method however, does not show the amount of water slippage through the valves and past the pistons; this may be determined, in the case of direct acting steam pumps by also making a "lock-up" test which consists of closing the discharge valve on the water end and turning full steam pressure into the steam cylinder. The strokes per minute which the pump makes under such conditions should be counted when the pump was tested under full working conditions; the difference between the two may be taken as the effective displacement of the pump as the movement of the water pistons under the "lock-up" test conditions represents the slip.

This "lock-up" test should not be tried with any piston or plunger pump having crank driven pistons as the positive stroke machine does not permit of cushioning effect and the water cylinder may easily be strained to the bursting point.

In testing displacement pumps the diameter of pistons or plungers and the length of stroke should be measured carefully when accurate tests are required and deducted from the number of strokes per minute which were counted.

Measurements of head are usually made with spring gauges of the vacuum and pressure type, but for low and moderate heads water and mercury columns may be used when convenient.

The water column is usually practicable only for low heads; as it necessrily registers actual pumping head. Less velocity head correction ,which will be referred to later. For example, for measuring a head of 50 feet with a water column or manometer would require a measuring column 50 feet high. The mercury column is very convenient as moderately high heads can be measured on a mercury column of reasonable length since one inch of mercury height in the column is equal to a height of 1.132 feet of water.

The mercury column may be of either the U tube type or a straight, one leg arrangement with the mercury contained in a cast iron pot or a glass bottle. In either kind of mercury column the reading should be made from the lower to the upper levels of the mercury, and the column should be provided with a sliding scale so that the zero point may be moved to follow the movement of the mercury and the scale should read in inches and tenths of inches.

When testing pumps, the gauges of whatever type should be placed as close to the suction and discharge nozzles of the pump as possible. When there is a suction lift a vacuum gauge or mercury column should be connected to the suction nozzle and a pressure gauge or mercury or water column to the discharge nozzle.

To total head is the sum of the reading of the two gauges, with usually a plus or minus correction according to the location of the gauge. Viz: If the vertical distance between the point where the suction gauge is connected to the pump or pipe shows that it is below the center of the gauge connected to the discharge of the pump, then the amount of this vertical distance should be added to the sum of the gauge readings.

If such vertical distance shows that the center of discharge gauge is below the point where the suction gauge is connected then the amount of this vertical distance should be subtracted from the sum of the gauge readings.

When there is a positive head on the suction of the pump, pressure gauge or mercury or water columns should be connected to both the suction and discharge of the pump and the total head which should be credited to the pump is the difference between the two gauge readings referred to a common level as to the location of the gauges.

There is in addition to the gauge readings another element entering in the total pumping head which must be credited to the pump in such cases as the suction pipe at the point where the gauge is connected is of larger area than the area of the discharge pipe at the point where the discharge gauge is connected.

This correction is called the "Velocity head" and it consists of useful effort imparted to the water, by the pump which on account of the difference of velocity in the suction and discharge pipes is not fully credited to the pump by the gauge readings.

It can readily be understood that the velocity of the water passing through the pipe at right angles to the connection to the gauges will have a partial suction effect which will reduce the gauge reading proportionately to the velocity of flow through the pipe.

This suction affects the results in an increase in the vacuum or suction gauge reading, but due to the higher velocity of flow through the discharge pipe the pressure gauge reading is reduced more than the suction gauge reading is reduced. So that in order to get full credit for the velocity head it is necessary to calculate it and add to the gauge readings the difference in velocity head between the suction and discharge. The velocity head is calculated on the same principle as the speed of centrifugal pumps and the formula is as follows:—

$$\frac{V^2}{64} = \text{Velocity Head.}$$

V=Velocity of water flowing through the pipe in feet per second.

Example:—

A pump delivering 1000 gallons per minute through an 8″ suction pipe and a 6″ discharge pipe. We have velocity heads as follows:—

For 8″ pipe:

$$\frac{1000}{50 \text{ x } 3.12} = 6.4' \text{ per second velocity.}$$

$$\frac{6.4 \text{ x } 6.4}{64} = .64' \text{ velocity head.}$$

For 6″ pipe.

$$\frac{1000}{28.3 \text{ x } 3.12} = 11.3 \text{ per second velocity.}$$

$$\frac{11.3 \text{ x } 11.3}{64} = 1.99' \text{ velocity head.}$$

Therefore the velocity head to be credited to the pump is:—

1.99 — .64 = 1.35 feet.

In figuring out the total pumping head it is customary to express this in terms of feet of water and where spring gauges are used which register in pounds per square inch and such pressure readings should be transposed to feet of water thus:—

1 pound per square inch = 2.31 ft. of water. Spring vacuum gauges are usually scaled to read inches of

mercury for which we have given the transpositions to feet of water in this chapter.

In connection with the pump test it is always advisable when it can be done to secure power readings at the same time, or under the same conditions for which the capacity and head conditions are obtained.

When steam driven reciprocating pumps are equipped for connecting a steam indicator, the obvious method for arriving at the power consumed by the pump is by means of the indicator card.

Steam turbine driven pumps cannot be tested for power consumption by means of the driving turbine unless a prony brake or dynamometer test is made on the turbine, from which power consumption corresponding with the steam pressure at the turbine nozzles and the R. P. M. can be applied to the pump test where the driving turbine shows similar pressure and power to that indicated by the brake test curve.

Where it is not practicable to make such a brake test on the turbine a charactiristic power curve can usually be obtained from the turbine manufacturer for the particular turbine required.

For testing electric motor driven pumps the wattmeter readings are most desirable as they show directly the power consumption and the only correction required is the efficiency of the motor, which should be deducted from the total electrical input readings and the remainder represents the brake H. P. used to operate the pump.

Ammeter and watt-meter readings may also be used but they require more calculation in figuring results and in the case of alternating current motors the power factor of the motor and the power line must be known and taken into the power calculation in figuring out the brake H. P. used by the pump.

In all cases where it is practicable, it is recommended that a volt meter should be connected into the power line near the motor under test, in order to ascertain that the voltage is normal and within the prescribed limits of variation for which accuracy of the watt meter readings may be obtained.

Full load motor efficiencies may be obtained by calculation from the nameplate ratings, which refer to input or electrical horse-power that is, the motor output or brake H.P. rating divided by the product of the imput or electrical H.P. ratings equals motor efficiency.

(To be concluded.)

PAPER DEVELOPMENTS

The week just past has witnessed what are undoubtedly among the most important developments from a constructive standpoint, which the Canadian paper industry has seen since the commencement of the setback of last year. Announcements were made affecting three outstanding branches of the industry. In the kraft paper branch, Wayagamack for the first time in months is now said to be working at full capacity, turning out 240 tons of pulp and 100 tons of paper per day. Price Bros., of Quebec, have resumed newsprint shipments to London, England, in fulfilment of a very large contract with the London Daily Express, owned by Lord Beaverbrook. In pulp, final arrangements have been concluded between the Saguenay Pulp and Paper Company, Limited, and the Becker interests of London, England, for a ten year contract, which is regarded as the largest ever made by any Canadian pulp Company.

The workshop of character is every-day life. The commonplace hour is where the battle is lost or won.

PULPWOOD NOTES FROM PORT ARTHUR.

A few months ago it was thought that the pulpwood cut in the area tributary to the Head of the Lakes would fall far below the average winter output. It will be found, however, that when the cut is complete it will exceed the average by several thousands of cords.

In the winter of 1920-21, the average price on the bank was $13.50 per cord; the average price during the present winter is $7.25 per cord. It is pointed out by local operators that, notwithstanding the serious slump in the price of pulpwood, pulp and paper, and the general market conditions now obtaining, the season's operations promise profitable results.

This winter's cut is controlled as follows:

Hammermill Pulp & Paper Co., Erie, Pa.	50.000	cords.
Detroit Sulphite Fiber Co.	6.000	"
Detroit Sulphite Fiber Co. left from 1921	12.000	"
Fort William Pulp & Paper Co.	42.000	"
Provincial Pulp & Paper Co.	15.000	"
Western Contracting Co.	15.000	"
Total	140.000	"

With the exception of the Fort William Pulp & Paper Company, and the Provincial Pulp & Paper Company, all of this wood will be exported to Port Huron, Detroit and Erie.

In addition to the above, there is a large cordage in the hands of private parties, mainly farmers, who cut on their own lands, in quantities ranging from 200 to 600 cords every year, and team the product to the harbor at Port Arthur, or dispose of it to the local mills.

According to a statement made by Premier Drury in the Legislature on the 8th instant, the revised agreement between the Government of Ontario and the Great Lakes Pulp & Paper Company, represented by Lewis L. Alstead, of Milwaukee, Wis., and George M. Seaman, of Chicago, Ill., owners of the Pic River and Black Sturgeon pulp limits, the company is obligated to provide $2,000,000 to be expended on the erection and equipment of a pulp and paper plant; $400,000 of this is to be expended by February 9th, 1924, and the balance before February 9th, 1925, with 600 hands employed by the latter date.

The plant shall be operated at such capacity as the Minister may determine, before February, 1925, and the paper mill shall have a capacity of 100 tons per day.

This industry is to be located on the Mission River, at Fort William.

JAPAN'S PEACE PROPOSITION.

Mr. A. E. Bryan, Canada's active Trade Commissioner to Japan, states that the Peace Exposition at Tokio, which opened on the 10th of March and will close in July, should be of particular interest to Canadian exporters.

Mr. Bryan is of the opinion that Canadian firms interested in the Japanese market, particularly on the Pacific Coast, should participate in this exhibition, which, he states, is to be the most important that has ever been held in the Orient. There is a market in Japan of 60,000,000 people who, particularly when business conditions become more normal, will always be ready to purchase from Canada.

H.R.H. the Prince of Wales will attend the Exposition and will be the guest of honor at the Canadian Exhibit on this occasion.

New Quebec Forest Facts

The world does move! New legislation is up for enactment by the Quebec Legislative Assembly which will make the forest safer for trees, and the trees better for industrial use. We should like to see the rangers given greater constabulary authority, however. The following is taken from the Montreal Gazette.

Quebec, March 10.—Important amendments to the law respecting woods and forests are contained in a bill introduced by Hon. Honore Mercier, Minister of Lands and Forests, and given second reading in the House last Friday.

More stringent provision is made against the danger of forest fires and a new policy of reforestation adopted. In addition to the present safeguards against fires, it is provided that every person who does not take the necessary measures to prevent a fire burning on his land from spreading to neighboring lands, shall commit an offence and be liable to a fine of from $25 to $2,500 for such offence.

It is also decreed that no person shall establish a sawmill on Crown lands and less than a mile from any timber limit without the written authorization of the Department of Lands and Forests, and every person when so authorized shall comply with the regulations of the department respecting the manner of disposing of the waste from the sawmill, to the piling of the products, and respecting all other matters relating to the protection of forests against fire. Every infringement means a fine of ten dollars for each day in default to comply with the provisions outlined, and in addition the judge may order the demolition of the sawmill within a delay of one month from the date of rendering judgment.

It is stipulated also that the owner or occupant of any land on which a fire is started, or originates, shall be deemed to be the person responsible for setting such fire, and shall incur the penalties provided for such offence, unless he is able to prove, to the satisfaction of the court, that such fire was not lighted by himself, nor by anyone in his employ or under his direction.

Next a clause states that the owner of any land adjoining a railway or public road, when thereunto required by the Minister of Lands and Forests, is bound to have the forest debris, accumalated or left on the ground, removed over a distance of one hundred feet on each side of the railway lands or of the public road.

The present law provides precautions to be taken by railways, but as the word "Engines" is used doubt has risen as to power to enforce this provision of the law as against other machinery operated by steam, such as a steam shovel, for example. This is made clear in the present measure.

Preventive Apparatus.

Another clause adds that every establishment located in a forest or at a distance of less than one mile therefrom, shall be provided with the most improved and efficient apparatus for preventing the escape of fire and sparks, under penalty for the owner of such establishment of a fine of ten dollars per day, counting from the date when he was notified by the minister to comply with the provisions of the law.

Other precautionary measures read that "every person or company depositing wood in the neighborhood or along the property of a railway shall comply with the instructions of the department with respect to fires, as regards the cleaning-up of the ground, removal of bark, chips, shavings, logs and other inflammable matter left on the ground for a maximum distance of three hundred feet from the railway track."

Campers and others who are fond of forest life are also given some attention by Hon. Mr. Mercier in this bill. It is provided that "the Lieutenant Governor-in-Council may, whenever he deems it necessary for the protection of the forests in territory declared to be fire districts, require that everyone wishing to enter and travel about in such forests between the first of April and the 15th of November, shall previously obtain a permit."

Travel Permits.

Such permit, called "travel permit" may be obtained, gratuitously from the fire ranger of the place or from any other authorized person.

The holder of a hunting or fishing license shall be exempt from such formality, but he shall be bound, when so required by any fire ranger, to show him his license, and to inform him about his goings and comings.

A mining prospector shall, in no instance, be exempt from such travel permit.

The minister may, with the authorization of the Lieutenant-Governor-in-Council, when the weather conditions require it, designate the camping places and exact all other measures calculated to decrease the danger of fire.

Every person violating these provisions shall be liable to a fine of $10 or imprisonment for a term of not less than ten or more than thirty days for the first offence, and of one hundred dollars or imprisonment for one month for a subsequent offence.

Every person duly employed for the protection of the forests against fire, may, in the exercise of his duties, enter and pass over any land. Those who hinder him are liable to a fine up to $50.

Reforestation Awards.

Hon. Mr. Mercier, in the matter of reforestation provides that whosoever plants a thousand trees to the acre on land unfit for cultivation, belonging to him, may take advantage of the reward which the Lieutenan-Governor-inCouncil may be pleased to fix, providing that the plantation has been kept in good order for at least five years. It is enacted that the Lieutenant-Governor-in-Council may from time to time make regulations respecting:

The encouragement to be given by way of money or in grants of lands for the work of tree planting.

The number of years which the plantations so rewarded shall be preserved before the final cutting.

The conditions which the persons claiming such awards must fulfill.

The municipal valuation of reforested lands and plantations for which a bonus has been given.

It is also provided that so long as at least three hundred trees to the acre are kept, lands replanted in trees shall retain, for a period of thirty years, the valuation which they had before he planting. At the expiration of such period of thirty years, the municipal valuation of such plantitions, provided they remain as wooded land, can only be changed every ten years. All lands reforested and receiving a bonus shall be subject to forest laws. The Lieutenant-Governor-in-Council may authorize public bodies and municipalities to acquire lands to form private or municipal forests, and to have the work of tree planting done therein.

Those who, without authorization, take possession of and occupy any portion of the public domain will be liable to a penalty of not less than one dollar nor more than one thousand dollars a day.

A new regulation regarding cutting in Crown lands is added, as follows:

In all forests belonging to the Crown, no clean cutting or operations constituting an exception to the regulations in force may be carried on without a special authorization from the Lieutenant-Governor-in-Council. The license-holder who wishes to obtain authorization to do extraordinary cutting in his forests on account of windfalls, fire, epidemics of insects or cryptomamic diseases, shall apply to the Minister of Lands and Forests and produce a plan showing the extent of forest so damaged.

JOINT SAFETY CONVENTION OF CANADIAN INDUSTRIES.

The Joint Safety Convention to be held at the King Edward Hotel, Toronto, 4th and 5th April, 1922, under the auspices of Canadian Manufacturers' Association, Workmen's Compensation Board, Department of Labor, Ontario Safety League, Ontario Pulp and Paper Makers' Safety Association, Electrical Employers' Association, Lumbermen's Safety Association, and Industrial Accident Prevention Associations, will doubtless be the most important affair of this kind ever held in Canada.

The convention will open on the morning of Tuesday the fourth with Sir John M. Gibson, K.C.M.G., in the chair. His Worship, the Mayor of Toronto, Mr. C. Alfred Maguire, will deliver the address of welcome at eleven o'clock.

Tuesday Afternoon, 4th April, 1922.

The meeting commencing Tuesday afternoon will be devoted to the presentation of the accident prevention problem under the chairmanship of Mr. W. C. Coulter, who is Chairman, Ontario Division, Canadian Manufacturers' Association. The first paper will be given at 2 p.m. by Mr. S. Price, Chairman Workmen's Compensation Board and is entitled "Ontario's Accident Prevention Problem." Mr. Price's grasp of the subject is unique and his paper is one of the utmost importance to every employer in Ontario. The second paper is on "First Aid and Industrial Nursing" by Miss Muriel Mackay, who is Chairman of the subcommittee on Industrial Nursing of the Public Health Section, Canadian National Association of Trained Nurses. The place of first aid and industrial nursing is appreciated by most employers and the paper is sure to bring out an interesting discussion. The third paper is by Dr. C. L. Starr, Professor of Surgery, University of Toronto, entitled "Surgical Treatment of Accident Cases." This phase of compensation costs is one on which every up-to-date employer will want full information and Dr. Starr's paper will give it. The fourth paper is on "Traffic Accidents" and will be delivered by Mr. S. J. Dickson, Chief Constable, Toronto, who has devoted many years of study to traffic problems. Every community has its traffic problems and the statement by Chief Constable Dickson is, therefore, of very wide interest.

Tuesday Evening — Dinner at 6.30 p.m.

On Tuesday evening at half past six there will be a dinner in the Ball-room, King Edward Hotel, with Mr. A. Monro Crier, K.C., as Toast-master. At the dinner Mr. Justice W. R. Riddell, K.C., will speak on "Accidents in Industry from the Economic Standpoint." This address will dwell on the economic side of our losses by accidents and the enormous proportions those losses may reach if allowed to go unchecked. The second address at the dinner will be by Lieut. Col. W. N. Ponton, K.C., Belleville, on "Accidents in Industry from the Humanitarian Standpoint."

Wednesday Morning, 5th April.

The session will open at 9.30 a.m. under the Chairmanship of Mr. George Carruthers, President Interlake Tissue Mills, Limited, Merritton, and President, Ontario Pulp and Paper Makers' Safety Association. The papers during Wednesday morning deal with the answer to the problem of accident prevention, the first being entiled "The Solution of the Accident Problem by the Educational Method," by Mr. J. H. Martin, Division Plant Superintendent, Western Division, Bell Telephone Company, Toronto. Mr. Martin's experience has fitted him peculiarly for this paper and his exposition is sure to be unusually enlightening and informing. The second paper is by Mr. Frank Ewart, Jacob, Armer and Byam, Toronto, and Vice-President of the American Institute of Electrical Engineers on "The Solution of the Accident Problem from the Engineering Standpoint." These two papers will give, when combined, the whole answer to accident prevention problems of industry as one deals with the human factor and the other with engineering revision in the plant. The last paper "General Accidents" by Dr. M. M. Crawford, Coroner, Toronto, is one of general interest as we have all come to realize to some extent at least, the cost of accidents on the streets, in the homes and in industry.

Wednesday Afternoon — Luncheon 1 p.m.

The Convention will end with the luncheon on Wednesday, 5th April, 1922, at one o'clock. Mr. D. A. Cameron, President of the Board of Trade, Toronto, will be in the chair, and the two speakers will be Mr. John R. Shaw, First President Canadian Manufacturers' Association, who will speak on "Accident Prevention from the Point of View of the Employer" and a representative of the Trades and Labor Congress of Canada, will deal with "Accident Prevention from the Point of View of Labor". The luncheon will be a fitting close to a great convention.

SIX PLANTS TO WORK TEN YEARS.

The contract of the Saguanay Pulp and Paper Co., referred to last week, is said to assure practically capacity operations over the period of 10 years to the producing company, who will have in operation six modern plants. It is stated that the Chandler plant has been greatly improved during the past six months, involving an expense of $300,000.

Sir Frederick, in signing the contract, represents what is known as the Ludgate Syndicate, composed of between 20 and 25 consumers of mechanical and sulphite pulp in England, France and Belgium.

A rough calculation makes the contract worth between $70,000,000 and $75,000,000. It will extend for 10 years and called for production by the Saguenay Pulp & Power Co. of 500 tons of mechanical pulp and 250 tons of sulphite pulp per day. This production is automatically sold, by the terms of the contract, on a basis of cost plus $10 per ton for mechanical pulp, and cost, plus $15 per ton, for sulphite pulp. The value of the mechanical pulp over the term of the contract will be, roughly $52,000,000, and of the sulphite pulp $22,000,000.

T. A. Tod Talks Paper Club

Mr. T. A. Tod, secretary of the Graphic Arts section of the Canadian Manufacturers Association, was the speaker at the luncheon of the Paper club, held on March 14, in Montreal. The following is his talk, largely dealing with salesmanship, which he calls Service Power.

Some philosopher has said that life is largely the pursuit of happiness. Happiness I take it, is the attainment of normal desires.

When we look at the world as constituted, we see that, almost universally, money is the medium through which normal desires are reached and satisfied, therefore, the pursuit of happiness resolves itself into the pursuit of money. Man seeking money (to attain happiness), seeks it by and through a daily activity that he exerts to that end; this activity which constitutes his major work is named variously and differently—his "Job," "Position," "Profession" or "Business" according to his circumstances.

On the whole, then, we find men seeking happiness (a universal search) by acquiring money, and we find them seeking to acquire money through a major activity, or mechanism, or tool, called "Business."

"The Business" then becomes an all important thing in the scheme of life.

Study the "Business"; study all the things it relates to; by doing this you will make it an efficient tool through and by which you may acquire money and reach happiness.

An old codger was a "regular" at church, never missing, always there, yet a queer old customer. Always in his pew and he always went through the same performance every Sunday. Two minutes of the sermon seemed to be his limit, at the end of that time he would slap his hand to his forehead as if he was in great pain, and then go hurriedly out.

Time came, and this peculiar old gentlemen died, and as the story goes, they opened his top piece and the mystery was solved. He had about a thimble full of brains and the rest was solid bone. Of course, the author of this is entitled to a blue ribbon from the Ananias Club. But how many salesmen there are today in the world just like the fellow with the ivory bean. They think they haven't any more room for added knowledge of affairs, nor any more time for discussion of problems in Salesmanship. They know it all, already.

I am glad to see by this magnificent assembly that we evidently haven't any salesmen in Montreal in the "ivory bean" class. I am most gratified to know that you men are alive to the advantage of mutual cooperation in studying the problems of your profession.

I am a great believer in organization. I try to manage one for your "Victims" and you will have to be careful not to let any of your secrets out while I am here, as I would be lacking in my duty if I didn't advise my members of any schemes I got wind of.

Now we have seen that in order to gain happiness we have to acquire money—and the question suggests itself—what is the best way to get money. Here are three ways of getting money. You can either:

1.—Inherit it
2.—Marry it
3.—Earn it.

The first way is an accident. It is sheer luck. It has nothing to do with either skill or merit. Hence it is always rather an unsatisfactory way to get money.

The second is sometimes luck, sometimes skill and sometimes merit. It is sometimes delightful and sometimes abominable.

The third way is never luck. It is always skill and merit. It is the way of satisfaction and self-respect.

Now, I take it for granted that all of you, or at any rate most of you, earn money by salesmanship to printers, which brings us to the principal point of our subject:—

What do our customers, the printers, expect of us; or to put it another way, what can we do in order to secure business from new customers and more business from old ones?

I told your president, I could give you the best possible talk by saying one word "Service" and he said "All right, but say something about it." I have heard some fine definitions of that word "Service" from time to time, but cannot recall any of them now, so I must confine myself to a few Do's and Dont's for paper salesmen, as they might appeal to a printer.

In the first place always remember that first impressions are most lasting as a rule, so never fail to appreciate the value of a smile.

Many people take themselves too seriosly, they seldom smile and go around with a continuous grouch. There is no commercial value in being sour, while the honest open smile has a high commercial value. The greeting of a pleasant smile and a pleasant word is the honey that catches both friends and bees-ness.

Someone has said "Keep Sweet—Keep Smiling—till 11 o'clock, and the rest of the day will be full of sunshine". Don't be a grouch, it doesn't pay.

Then again—cultivate patience. I fancy that if I could read your minds, a great many of you are thinking, "Well I guess we have to—especially with some printers"; nevertheless my friends, remember patience is by no means the least of the virtues.

You want to sell paper, and the men you sell to have probably more worries in their minds than most any other manfacturer. I often think that if some paper salesmen really knew all the many details and worries of the printing business, they would oftentimes be more sorry for the printers than they are, so be patient when your printer friend may sometimes be hasty or irritable.

Always try and have something of interest to tell your customers. How many salesmen call on printers and say "Can I do anything for you to-day Mr. So-and-So?" and when he says "No," out they go—while others will generally have something of interest to the printer in the way of some new line his firm has got—some special good point about an old one—the suitability of some brand of ledger paper for special purposes—the fine finish on a new line of translucents or coated blanks—the strength or new colors of an index Bristol and many other points of interest that can be raised regarding the lines of his firm.

Then how about the samples of your goods the printers have—or the sample cabinets, these have been gotten up at great expense by your firm and they lose a great deal of their value if not kept up to date — and it is wonderful how samples do get lost or are given away to customers.

Wouldn't it be an opportunity to please your customer if you went over his samples occasionally and replaced the missing ones. I am sure he would appreciate it, and believe me, there is more business done by those who have samples than you would credit. When figuring a job the printers naturally turn to their samples first, and its the firm who have their samples there that has the best chance of getting the business.

One printer told me once that he had very strong objections to paper salesmen hanging around his office talking to his employees and wasting their time, which often happened on bad days.

I have known some paper salesmen to try and gain favor with printers by telling them about some job another printer is figuring on—there are very few printers who are not wise enough to know that a man who would tell him about another would tell another about him—it's one of the biggest mistakes you could possibly make.

What a printer expects more than anything else is "Service."

Get him your samples when he asks for them as quickly as you can, when he wants something in a big hurry—do your utmost for him—if his order is not too large, take it yourself, he will appreciate it more than you ever dream of.

If he wants to know some price, or when he can get delivery of an order, follow it up yourself, don't turn it in to the office and then forget about it, let him see that you take an interest in him—he notices all these little "services" and it will pay you.

When you have made a sale, don't let it be finished there. See that your purchaser gets his goods delivered to him so that he won't waste his time inquiring when he is going to get that ream of bond bought yesterday. Keep after you shipper, and see that he gives service, if the goods are not out of stock.

Out of stock—This is a very popular phrase with some paper houses, and at times is most awkward for the purchaser. The salesman can with a little thought step in the breach here; he can find out from the various houses in his territory if they could "lend him a ream of bond" just to keep a customer going until next week when he would return same, this is very rarely done but is a great service and help to the buyer at times as there are many cases in which he must have "exact as sample" for his order. This also ensures your water-mark being used on the next order.

In many cases a salesman's territory takes him from one end of the City to the other and perhaps when he his **personal** service, it would not be a hardship on the traveller to call up his customer in the West when he is down East or *vice versa*, telling him what time he would be around his way so that if there is any prospects he will be in the running for same.

Change in Prices.—When there is a raise or decline on your list inform your purchaser immediately by phone and when you get to him, get his price list and make the necessary alteration if a new list is not being issued, a cent advance may not be much on a ream, but a man who has made out his estimate on the old price and finds that there has been an advance feels as if he could murder the traveller for "doing him in the eye" although the traveller never meant this to be the case.

Wrong delivery.—When your clerk has shipped out the wrong stuff, if you have to rectify the error by lugging the ream yourself, do so, as in many cases this ream is wanted next on the press and everything is being made ready, so you can imagine the disgust where blue bond is delivered for white, etc.

To be a successful salesman you must create permanent, profitable patrons for your firm.

If you will increase your service rendering power, you must so apply your developed service-rendering qualities, your knowledge of human nature, and your knowledge of business, that you will create in the minds of those with whom you deal, or come in contact, the effects of favorable attention, interest, desire, action, confidence and satisfaction.

Don't forget that the foundation of all successes is built upon confidence.

The secret of success is not a secret. Nor is it something new. Nor is it something hard to secure. To become successful, become more efficient. Do the little things better. So work that you will require less supervision. The least supervision is needed by the person who makes the fewest mistakes.

Do what you can and do what you should do for the institution for which you are working, and do it in the right way, and the size of your income will take care of itself. Let your aim ever be to better the work you are doing. But remember always that you cannot better the work you are doing without bettering yourself.

The thoughts that you think, the words that you speak and the deeds you perform are making you either better or worse. Realize with Henley that you are the "Master of your fate and the captain of your soul." You can be what you will be. Forget yourself in rendering service to others.

As an employee, strive to make yourself of greater value to your employer. Look upon yourself as a manufacturer. Think of yourself as being in a business for yourself. Regard yourself as a maker and seller of service, and ever bend your thought and your energies toward the improvement of your product. The wise manufacturer never injures his machinery willfully. Your body, mind, your soul, serve as your plant.

Eat and drink only that which will nourish your body, entertain only those thoughts that will enrich your mind, and if you feed your body with the best physical food and your mind with the best mental food, you will build up a Service Factory, that will find its product in constant demand.

The world is hungry for Quality Service. It wants to pay for it. It is paying for all it can get. The market is not crowded.

There is a law of business gravitation: A law that inexorably says "up" if you are with it and "down" if you're not.

There is a chance for you right now.

There is a chance for you right where you are.

The time to start is now.

SALESMEN EAT ONCE A MONTH.

New York, March 18.—Tuesday evening, April 11, will be the big festival of the salesmen of the paper industry.

A dinner-dance with a noted speaker as the banuet guest, and ladies as the guests of the membrs, will be the wind-up event of the program, for which special committees have been named, and it is planned to make these affairs for the women of the industry a feature of both the annual convention henceforth and of the fall business conference as well.

The New York salesmen will hereafter hold a monthly luncheon like that already in vogue at Chicago, and all visiting members of the Association will be invited to attend. The next New York luncheon will be held Wednesday, March 29, to complete plans for the convention, and thereafter the meetings will be held on the fourth Wednesday of each month. The Chicago luncheons are the second Monday of each month, and the dates were so set that salesmen on the road may be able to attend both luncheons the same month.

STEAM REQUIRED FOR DRYING PAPER.

The Service Comittee of the Technical Association of the Pulp and Paper Industry has started something of great value to the industry in their preparation for a discussion of "Heat Requirements for Drying Paper" at the meeting in New York, April 11-13.

The answers to the questionniare sent out to members by the Service Committee, indicated a majority particularly interested in the subject of drying systems in the paper mill. In planning to deal with this subject in the most practical way, the committee has considered what is a rational basis of determining the drying efficiency. On account of the differences in grades and weights of paper, and the rate of production, a more fundamental basis must be taken than either the pounds of steam used per pound of paper produced, or the pounds of paper dried per square foot of drying surface.

The drying operation consists essentially in the evaporation of a given amount of water in a given time, by the use of heat. The factor of efficiency on a rational basis, therefore, is the number of heat units theoretically required in a given time, divided by the number of heat units actually employed. To determine the theoretical quantity of heat units, one must know:

1. Lbs. of water evaporated per hour. This figure is calculated from the weight of paper produced per hour, knowning both:

a. The moisture percent in the sheet going to the first dryer.

b. The moisture percent in finished paper.

2. The heat units required to evaporate the quantity of water in "1", taking into consideration:

a. The temperature of the sheet to the dryer (in other words, the temperature of the water to be evaporated).

To determine the heat units used, it is necessary to know:

1. Lbs. of steam going to dryers per hour.

a. Steam pressure.

2. Lbs. of condensed water from the drying system.

a. Temperature of condensed water.

3. Lbs. of steam to air heater for vapor absorption and ventilation.

a. Steam pressure.

4. Lbs. of condensed water from air heater.

a. Temperature.

It is considered that the drying of paper depends on two factors: the application of heat and the circulation of air. It is therefore necessary to know in relation to the circulation of air, if possible:

1. Cu. ft. of air removed.

a. Temperature.

b. Humidity percent.

2. Average temperature and humidity of the air in the machine room at 6 ft. from the floor. This level is taken arbitrarily.

3. Average temperature and humidity of the outdoor air.

By calculation, having the necessary data, the factor of drying efficiency can be obtained. The difference between unity and the drying efficiency percent must represent either a loss of heat by radiation and that carried away with the exhaust air, or the extra heat that is required for evaporation on account of the incomplete removal of vapor-laden air.

This preliminary statement is made in order that you may understsand the viewpoint of the committee. It is recognized that climatic conditions, the temperature and humidity of the atmosphere, as well as the construction of the machine room, the character of its walls, windows and roof, have an important bearing on the quantity of heat required under different conditions. Other influencing factors are doubtless the weight of the sheet and grade of paper as affecting the rate of drying; also the area of effective drying surface in relation to the work to be done.

You are asked to consider the outline as given above and criticisms of it will be welcome. The committee believes that considerable investigation has been made in the different mills covering various phases of the drying problem, and has prepared a list of questions which were submitted to members.

JAMES HOPE, PIONEER STATIONER, DEAD.

One of the most respected and pioneer business men of Ottawa died last week in the person of Mr. James Hope, founder of the firm of James Hope and Sons Limited, leading bookstore, stationery, and printing establishments. His career stands as a landmark in perseverance and endeavor, which resulted, in the firm of James Hope and Son Ltd., being generally recognized as one of the leading book establishments of Ottawa, if not throughout the Dominion. At the time of his death Mr. Hope was in his 89th., year.

The story of the life of James Hope, is the unusual one of a young man in England employed as a draper's helper, deciding to make Canada his home, a few years after his arrival in this country, he succeeded in persuading his employer, Mr John Durie a general store keeper, to go into books and stationery, and had to go back to England to purchase a suitable stock. The consignment was among the first of books for a general store book stock, that had been brought to Ottawa.

The first invoice received by Mr. Durie is said to have staggered that gentleman, but he kept the books and realized a very handsome profit on them.

Shortly afterwards Mr. Hope entered the employ of James Campbell and Sons of Toronto as a traveler, continuing in that capacity until invited to enter partnership with Henry Horne, who had been in business in Ottawa for several years for himself. The principal business carried on by Horne and Hope was bookbinding and selling general stationery, etc.

Following the death of Mr. Horne, Mr. Hope bought out the business of Henderson and Co. (conducted by the late John Henderson, city clerk) and later the business of John Durie and Son and James Ogilvie. Incorporation of the business as James Hope and Sons, Ltd., was effected in 1915. It is just 69 years since the business was established.

After the acquisition of John Durie and Son, Mr. Hope went in extensively for the sale of books and from that date continued to build up a splendid and popular book department, undoubtedly one of the finest in Canada.

Although nearing the four score and ten mark, Mr. Hope continued to take an active interest in the business, although the cares of the management were left in the hands of his sons, James C. John, and William W., who survive. There is also one daughter, Miss Fannie, at home.

One of the notable incidents in connection with the Hope business is the loyalty of its employes, of whom three have been with the firm for thirty-five years, and several from ten to twenty years.

Technical Section

REVIEW OF RECENT LITERATURE.

A-4; F-0. The Chemical Constitution of Soda and Sulphate Pulps from Coniferous Woods and their Bleaching Qualities. Sidney D. Wells, U. S. Dept. of Agriculture, Forest Service, Forest Products Lab., Madison, Wis. **J. Ind. Eng. Chem.**, xiii, 936-939, (Oct. 1921). The chemical characteristics of soda and sulphate pulps indicate that they are a very pure form of wood cellulose and capable of high yields of white fibrous and resistant material. The sulphate process is much more efficient than the soda process in yielding a bleachable pulp from coniferous woods. The coloring matter in pulps is of the nature of a dye and can be removed without materially reducing yields. Most of the action in cooking to reduce bleach consumption is to dissolve and degrade the cellulose. Modifications in bleaching methods give promise of greater results than modifying cooking methods. Modifications in which the bleaching operation was divided into two steps, with washing between steps, cut the bleach requirements in two. Pulps of better quality, both from physical and chemical considerations, are obtained by cooking the wood as little as possible in isolating the fibers and by accomplishing as much of the burden of purification as possible in the bleaching and washing operations. - A.P.-C.

A-14. The Testing of Paper. U. S. Bureau of Standards Circular No. 107. Feb. 12, 1921. The circular contains information relating to the methods of testing and the aparatus employed in the paper faboratories of the Bureau of Standards for the routine testing of paper. In the introduction a brief description of the raw materials used, the size and importance of the paper industry, and the general groups or classes of papers are given. The classification of paper is only of a general nature. The purpose of the tests and the development of methods of testing is touched upon, and suggestions are given as to methods of developing specifications. The testing of paper is divided into three groups, and the methods are classed as physical, chemical and microscopical. Under each group the various standard methods are given in detail with photographs of apparatus employed. No attempts are made to interpret results. It is brought out that changes in temperature and humidity affect the physical qualities of paper, and for this reason a constant temperature and humidity room has been installed. It has not been possible to give the relation between humidity and temperature changes and the physical characteristics of paper, but it is hoped to have this information available later. The chemical testing of paper is concerned with the determination of the amount and kind of sizing in the paper, and the amount and kind of filler or loading materials used, and the methods are given in some detail, both qualitative and quantitative. It is desirable to know the kinds of fibrous materials out of which a sheet of paper is made and for this purpose certain stains are used to color the fibers on a microscopical slide. The procedure is given and suggestions are made as to the value of microphotographs. A short working bibliography is included, as well as regulations for tests and methods of sampling and submission of samples for test. - A.P.-C.

A-14 The Testing of Paper. U. S. Bureau of Stand-Examination of Paper. C. Wisbar. **Mitt. Materialpruf.**, xxxviii, 316-318, (1920); **J. Soc. Chem. Ind.**, xl, 689A, (Oct. 15,1921). The microscopical examination of paper is facilitated by the use of solutions of stannic chloride and iodine, calcium chloride and iodine, and particularly aluminium chloride and iodine. The fiber mass is moistened with dilute glycerin on the object glass, some drops of aluminium chloride-iodine solution are added and then taken up with blotting paper, followed by a drop of zinc chloride-iodine solution, after which the cover glass is fitted. The yellow color of the lignified fibres is darker and more stable than when zinc chloride-iodine alone is used, the wood cellulose is colored in pure blue tones. If the red-violet is too pale a second drop of zinc chloride-iodine solution is added, whilst if the blue is too dark zinc-chloride-iodine solution somewhat diluted with water should be used. The differentiation of straw cellulose from wood cellulose is well effected with dilute calcium chloride-iodine solution, the former giving a grey-blue color and the latter yellowish-red. Aluminum chloride-iodine and stannic chloride-iodine solutions are prepared by dissolving 0.1 g. of iodine and 0.5 g. of potassium iodine in the minimum quantity of distilled water, and making up to 10cc by the addition of a saturated aluminium chloride solution, or stannic chloride solution of specific gravity 1.53. Calcium chloride-iodine solution is prepared in a similar way except that the mixture is filtered through asbestos and the filtrate diluted with an equal volume of water. A.P.-C.

A-14. The Nutting Colorimeter. Anon. **Chem. Age**, iii, 594-595, (Nov. 27, 1920); **Chimie et Industrie**, vi, 483, (Oct. 1921). The Nutting colorimeter is constructed for the analysis and examination of papers, powders, liquids, fabrics, sources of light, etc. It also permits of the determination of the color of natural objects (feathers, flowers), the fading of shade with time, the degree of accuracy of reproduction of a given shade, the comparison of colors. It is constructed according to the principle of monochromatic analysis, that is it indicates the wave-length of the predominating shade, or of its complementary shade, and the percentage of white. A pure white light is mixed with a pure spectrum color, and the proportion of the two is adjusted until the color to be analysed is exactly reproduced; the wave-length of the predominant shade is then determined, and also the proportion of white mixed with it. The apparatus consists of a two-branch spectroscope, the white light coming through one branch and the light to be analyzed through the other. -A.P.-C.

A-14 The Principle of the Elmendorf Paper Tester. Armin Elmendorf. **Paper**, xxviii, 15-17, (Aug. 10, 1921). Also, E. Messmer. **Monit. Papeterie Française**, lii, 679-681, (Nov. 1, 1921). The tearing strength of the paper is tested by determining the work done during the tear and dividing by the length of the tear so as to obtain the average force. The mechanism adopted consists of a swinging pendulum or segment provided with clamps for holding the paper. A knife blade is provided for cutting a slit in the sample to start the tear. If the pendulum or segment were allowed to swing when there is no paper to be tested, it would swing as far to the right as it was at the left at the start. The tearing of the paper requires a certain amount of work, which is equal to the difference in the potential energy of the pendulum in the starting position and its potential energy at the end of the swing after the tear has been made. The amount of swing to the right is indicated by means of a pointer which comes in contact with a stop at the base of the machine to prevent it from swinging to the right but which is carried back by the pendulum (due to slight friction at the hub) as the segment recedes from its maximum position at the right. The scale is calibrated so that if 8 sheets are tested at one time the reading multiplied by 4 gives the force in grams. - A.P.-C.

A-15 Fluorescence of Cellulose and its Derivatives. S.J. Lewis. **J. Soc. Dyers and Col.**, xxxvii, 201-204, (1921); **J. Soc. Chem. Ind.**, xl, 620A, (Sept. 15, 1921). The method of observation adopted consists in focussing an ultra-violet spectrum on the specimen of paper or fabric placed in the position usually occupied by a photographic plate in a large quartz spectrograph. A fluorescent glow is emitted from the surface of the material and is photographed by means of a special camera of the ordinary type, the back lens of which is inserted in the back of the camera of the spectrograph. The general fluorescent properties of cellulose and its derivatives have been established and it is shown that specimens differ not only in their fluorescent power but also in their selective properties for light of various wave-lengths. Material regarded as the same by manufacturers and experts are by no means the same from the standpoint of their fluorescent properties. Two No. 30 Whatman filter papers, for example, taken from different batches were widely different, but repeated experiments show that the same specimen gives approximately constant results from time to time. - A.P.-C.

A-15. Depolymerization of Ethylcellulose. K. Hess, W. Wittelsbach, and E. Messmer. **Z. angew. Chem.**, xxxiv, 449-454, (1921); **J. Soc. Chem. Ind.**, xl, 688A, (Oct. 15, 1921). Reliable conclusions as to the constitution of cellulose from the products of acetolysis of alkylated celluloses can be drawn only when alkylation has been conducted in such a way as to exclude the probality of the disruption of glucoside or ether-like linkages. Under these conditions the limit of alkylation is reached when two ethyl groups per $C_6H_{10}O_5$ have been taken up. The resulting diethylcellulose is an individual substance, and when subjected to acetolysis a far-reaching depolymerization occurs with the absorption of one acetyl group for each $C_6H_7O_2(OC_2H_5)_2$, and without the generation of a free aldehyde group. The substance contains at most four dextrose residues, and since free aldehyde groups are absent it must be assumed that these structural units are held together by another linking system than the "glucoside" linkage in the original ethylcellulose. Although with different preparations isolated at different stages of the acetolysis approximately identical molecular weights were obtained, differences in optical rotation and melting-point indicate that the depolymerization is accompanied by isomerization.-A.P.C.

A-15; K-20 The Action of Thiocyanates on Cellulose. H. E. Williams. **J. Soc. Chem. Ind.**, xl, 221-224T, (Oct. 15, 1921); **Paper**, xxix, 9-14, (Nov. 2, 1921); **Paper Trade J.**, lxxiii, 48-49, (Dec. 15, 1921); **Pulp and Paper**, xix, 1277-1281, (Dec. 22, 1921). Recent work by the author has shown that to dissolve cellulose a concentrated aqueous solution of a neutral or acid salt must consist of a liquid hydrate - an associated molecular complex of salt and water - which must have a viscosity above a certain minimum and a positive heat of dilution between certain well-defined limits. Of all the cellulose solvents examined the concentrated solution of calcium thiocyanate has the most profound and far reaching effects, and as it has the further industrial advantage of having a cheap base it is the one that has been the most closely studied from an industrial standpoint. A solution of calcium thiocyanate of such concentration that it boils between 135° and 150° C will dissolve bleached cotton or chemical wood pulp when heated to 80°-100°C. A portion of the calcium thiocyanate solution may be replaced by a solution of certain salts which do not react chemically with it, but maintain its boiling point and other necessary properties without altering the solvent properties of the solution for celluloses. Such a solution of mixed salts will serve the same purpose as a cellulose solvent as the pure calcium thiocyanate solution. The most suitable salt for this purpose is calcium chloride, which has the advantage of cheapness. The possible industrial applications of these observations include the spinning of filaments, mercerization of cotton fabrics, parchmentization of paper, and the preparation of "vulcanized" fiber. (The parchmentization of paper by thiocyanates is covered by the following patents: U.S. 1,333,465; Eng. 124,979; Fr. 500,504; Can. 203,-364. Cf. **Pulp and Paper**, xviii, 953, K-20, Sept. 9, 19-20.) - A.P.-C.

B-2. Reforestation in France. Ch. Groud. **Papier**, xxiv, 301-303, (July 1921). Brief and general discussion of the merits of various species of coniferous trees for reforestration in different parts of France. -A.P.-C.

E-2. Volumetric Determination of Sulphurous Acid in Organic Substances by the Distillation Method. V. Froboese. **Arbb. Reichs-Gesundh.-Amt.**, lii, 657-659, (1920); **J. Soc. Chem. Ind.**, xl, 641A, (Sept. 15, 1921). The method of Hass (distillation in a current of carbon dioxide, oxidation to sulphuric acid, and gravimetric determination of the latter) is modified in that the sulphur dioxide is absorbed in a known quantity of sodium bicarbonate solution, then oxidized to sulphuric acid with hydrogen peroxide, and determined by titrating the excess of alkali with hydrochloric acid in the presence of methyl orange. If necessary the sulphuric acid may afterwards be determined also, as barium sulphate. No appreciable loss by oxidation of sulphurous acid occurs during the distillation even without carbon dioxide, but probably some oxidation occurs when the liquid is first heated. With a current of carbon dioxide, distillation of volatile acids may be prevented by using a long reflux cooling tube. The method is suitable for sulphite waste liquors. -A.P.-C.

L-4. Paraffined Paper Bottle. Can. patent No. 194,-956, Jesse H. Perrault, Detroit, Mich., U.S.A., Dec. 16, 1919. The bottle is made up of layers of paraffined paper, the fiber being disposed transversely to the receptacle. A waxed cord is disposed in a groove between the layers, an end of the cord projecting, so that the bottle may be opened by severing the successive layers on pulling the string. Claims allowed 9. -A.P.-C.

L-6. Some Modern Plastics. Albert Hutin. **Rev. Prod. Chim.**, xxiv, 525-534, 621-628, (Sept. 15, Oct. 31, 1921). The author gives such informations as he was able to obtain from scientific literature, patent specifications, and his personal researches, concerning a large number of commercial plastics, including vulcanized fiber and numerous plastics with a cellulose base. - A.P.-C.

UNITED STATES NOTES

The Kimberley-Clark Company, Neenah, Wis., is one of the few industrial enterprises in the United States that have refused to regard their safety and service work as a frill and the company has maintained it continuously throughout the recent period of re-adjustment. The two larger plants of the company at Kimberly and Niagara, Wis., with slight interuption, ran ran full throughout 1921. M. G. Hoyman, safety director of the company, reported only eleven minor accidents in the Niagara plant in 1921. They caused 320 days of lost time. Approximately 120,000 cords of wood were handled by the force of 700 men. In 1915, transfer of the Forestry Service from the Department accidents, with a loss of 1757 days. At Kimberly, where 300 men are employed, there was clean record for safety from October 12 to the end of the year.

The American Forestry Association reports that hundreds of organizations in all States of the Union are filing protests with Congress against the proposed tansfer of the Forester Service from the Department of Agriculture to the Interior Department.

Less than half the usual quantity of pulp wood and only a few million feet of long logs will come down the Penobscot this Spring, according to predictions made by employment agents in the Maine lumber woods. The winter just ended is regarded as the dullest experienced in the industry in more than forty years. As there are no small operators in the woods, and with the big pulp concerns heavily overstocked with wood cut last year and earlier, operations during the winter were curtailed 50 per cent or more. The slump in woods operations has caused quite a recession in wages from the fabulous war time rates. Two years ago men were getting as high as $3 and $3.50 a day for work that now commands only $1. to $1.25 a day. As regards the mills, one of the questions no one seems able to answer is :"Why, knowing as they must have known, that the war boom was certain to collapse within a year or two, did the pulp concerns pile up several years' supply of wood at top prices?"

Frederick H. Glover, until recently assistant manger in the Chicago branch of the Whitaker Paper Company, has joined the forces of the American Writing Paper Company to take charge of the Specialties Section for the latter concern. Mr. Glover has had considerable experience in paper salesmanship, beginning with the Whitaker Paper Company in Cincinnati in 1913, and serving this big jobbing concern in several of its branches almost continuously for nine years.

The American Writing Paper Company announces the return to its sales forces of Augustus C. Lamb, a former well known figure in the paper trade, who, since his resignation from the selling staff of the big Holyoke paper company in 1919, has been factory manager of the Russ Gelatin Company of Boston and Westfield, Mass., makers of animal glue and gelatin for food and technical purposes. Except for the two years spent in his work for this concern, Mr. Lamb was employed during the greater part of two decades in various capacities, both in the manufacturing and sales ends of the paper industry, with organizations included in the American Writing Paper Company group. He was the Company's sales manager at the time he left to go with the Russ Gelatin Company.

The Concord Paper Company, of Brooklyn, N. Y., has built up an immense business by the elimination of waste, and as result, many big business houses have added revenue to the firm's ledger, where formerly debts were written. Officials of this company have demonstrated to many business houses the advisability of saving and baling waste paper, which it would otherwise cost money to get rid of, and to sell this paper to the Concord Paper Company. The paper is remanufactured and a great saving is thus effected all around. Much more attention has been paid to the conversation of old paper in recent years because of the inroads which have been made into the natural puulp wood forests, and the necessity for full use of all available raw materials in the manufacture of paper.

Frank C. Overton, of Castle, Gottheil & Overton, was re-elected president of the National Association of Waste Material Dealers at the annual meeting of this organization held March 15 at the Hotel Astor, New York City. This meeting was well attended and brought out some interesting discussions and addresses. A new classification for waste paper was adopted by the members of the Waste Paper Division. The classification was drawn up by the Writing Paper Manufacturers' Association, and was accepted as proposed following a lively discussion.

At the annual meeting of the Paper Association of New York City, J. C. Mallalieu, of the George W. Millar Company was elected president for another term of one year. As an economy move, the Association voted to discontinue its traffic bureau after May 1. Reviewing business conditions, the report read to the meeting classed the past year as having been attended with greater loss to the paper merchant than any previous year within the memory of anyone present. The year 1922 is regarded as promising a more hopeful showing at its close. The meeting marked the twentieth anniversary of the association's birth.

Plans are being made by the Dominion Holding and Investment Corporation of Norfolk, Va., to operate a line of fuel supply ships between Norfolk and Canadian ports to ship coal to Canadian paper mills which heretofore have obtained their fuel supply from the great Lakes region. Cargoes on the return voyges of the carriers are to consist of timber, pulp and paper, the products of the mills, discharging the first two items at North Atlantic ports and the paper at Norfolk. Operations are to begin some time during the Spring. From three to five ships will make up the concern's fleet of carriers.

John F. King, prominent paper manufacturer, president of the Rex Paper Company, died at his home in Kalamazoo, Mich., on March 13. His death was unexpected as it was supposed he had recovered from an attack of influenza and pneumonia which had made necessary a trip to the Pacific Coast early in the winter. Mr. King had just returned to Kalamazoo in excellent spirits and apparent good health, when he was seized with a sudden attack of illness to which he succumbed. He was 64 years old, and he is survived by his widow, a son and a daughter. Mr. King's long career in the paper industry began several decades ago in Holyoke, Mass.

PULP AND PAPER NEWS

Construction has been commenced on the new mill at Port Arthur, Ont., of the Provincial Paper Mills, Limited. H. S. Taylor, Ltd., Montreal are the engineers.

Mr. W. H. Cressy, of the A. Maurice Sales Company, New York, was a visitor to Montreal last week.

The Forestry Students Club of Toronto University, comprising students of all four years in Forestry, held their closing meeting for the 1921-22 session Friday night, March 17th. The speaker was Mr. Nelson Gain, Superintendent of the Don Valley Paper Mills, who gave an illustrated talk on pulp and paper manufacture, showing the relationship between the forest and the paper mill.

Mr. Mark G. Cohen of "Levi's" paper stock dealers, Toronto, who has not been feeling very well lately, is in Atlantic City on a brief vacation. He is accompanied by Mrs. Cohen.

Mr. Jean Rolland, of the Rolland Paper Company, was in Toronto last week.

Fire in the Allen Company's building, Simcoe Street, Toronto, did $50,000 damage, including some water damage to the stock of the Allen Paper Company, who sell fine writings. Fortunately the fire was in a remote part of the building, otherwise they would have lost heavily, as they carry a large stock of bond and high grade paper.

Mr. A. G. Pounsford of the Port Arthur Division of the Provincial Paper Mills was a visitor in Toronto last week.

The Ontario Pulp and Paper Makers Safety Association is taking a prominent part in the Joint Safety Convention in Toronto April 4th and 5th. Mr. George Carruthers, president of this Association, is to be chairman on the second day of the convention. Mr. A. P. Costigane, secretary and engineer for the Association, is chairman of the Committee on Arrangements.

ABITIBI APPEARS VERY STRONG.

Net earnings of $4,678,172, the second largest in the history of the company, are shown in the eighth annual report of the Abitibi Power & Paper Company. The most noteworthy feature of the exhibit lies in the drawing upon surplus to the extent of over two millions of dollars to provide for depreciation of inventories, and for the wiping out of an item of nearly half a million for Government taxes for the years 1919 and 1920. This naturally leaves a surplus comparing unfavorably with that of the previous year, but the company, through this drastic action would seem to be starting the year 1922 with a clean slate and in a favorable position to take advantage of the gradually improving business opportunities.

In his remarks to shareholders, President Anson says:

"The completion of the extensions to the plant was considerably delayed, and no part of the product from the new machines was available until July. Since then, however, the new machines and the Twin Falls power plant have both been in successful operation and a production of over 11,000 tons of newsprint per month obtained.

"The company has closed contracts for paper during the current year sufficient to operate at practically full capacity.

"The construction of the company's extensions is now completed, and all liabilities on this account are shown on the balance sheet. Ample reserves have been made for all Government taxes and for depreciation of wood and other inventories."

FRASER COMPANIES ON GOOD FOOTING.

By despatch. A strong balance sheet was presented to shareholders of Fraser Companies, Limited, at their annual meeting at Edmundston last week, although earnings were materially lower. Net profits from the company's operations for the year amounted to $1,001,459, as against $2,157,618 last year. From the net profits were deducted $199,227 for bond interest and $333,873 for other interest, leaving a balance of $468,359, which, added to last year's surplus, left a total at credit of profit and loss of $2,745,141.

From this balance there was appropriated for depreciation an amount of $445,572, for depletion $235,463, annual proportion of discount on securities sold $31,500, and for payment of Dominion Government taxes for previous year $249,462.

In view of the decline in replacement value of logs and manufactured lumber, pulpwood and supplies, the company wrote its inventories down to market value by appropriation of $1,000,000 from profit and loss for this purpose.

After the above deductions there remained at credit of surplus account $783,142.

Demand Was Unsatisfactory.

The President of the company, Mr. Archibald Fraser, in addressing the shareholders, said in part as follows: —"In the face of unsatisfactory demand and declining prices for your company's products namely, lumber and bleached and easy bleaching sulphite pulp—your company's operations have been steadily carried on throughout the year, your sawmill operating full and your pulp mills for the most part producing to capacity,thus carrying out the process of liquidation of high priced inventories.

"Since the first day of this year there has been some improvement in business conditions. Your company's pulp mills have operated full since January first and your woods operations now being carried on will result in delivering at your mills in the spring a large quantity of logs at low prices.

Outlook for Current Year Favorable.

"It is felt that your company's position from now on will show steady improvement, and that the combined effect of writing down inventories to market values and the influx of raw materials at low prices will result in a satisfactory showing for the current year."

Directors elected at the annual meeting were the following:—Archibald Fraser, President; Donald Fraser, Vice-President; A. W. Brebner, Treasurer; W. Matheson, Secretary, and Thos. Matheson, all of Edmundston, N.B., and W. C. Pitfield of Montreal.

Mass.

British Trade News

(From our London Correspondent.)

London, March 7, 1922.—The proposal to combine the British esparto paper mills has not matured so far. Differences of opinion arose as negotiations developed and Sir Frederick Becker, who, it was presumed, would be chairman of the combine, has withdrawn his name. As things stand at present the proposal has practically fallen through and its resurrection will come—if ever it comes—as a surprise to paper producers outside esparto section.

Chadwick & Taylor, Ltd., have become allied with Charles Marsden & Sons, Ltd., and their mill is in Manchester. Canadian groundwood, made at Chicoutimi, will be one of the raw materials used in the mill. The pulp is shipped straight to the Manchester ships canal and unloaded at a haulage cost of 12 cents a ton.

Imports of Boards.

Canadians engaged in the manufacture of pasteboard, cardboard, and millboards should be interested in the following imports into the British market during January. They are the latest figures and under the heading of leatherboards and strawboards, Canada does not appear as a shipping country:—

Cardboard and Pasteboard: From Canada, 58 tons 12 cwts; Netherlands, 47 tons 15 cwts.; Belgium, 7 tons cwts.; Switzerland, 2 tons 4 cwts.; Norway, 20 tons 3 cwts.; Germany 272 tons 16 cwts.; U. S. A. 13 tons 7 cwts.; Sweden, 45 tons 1 cwt.

Leatherboard: Total from all sources (mostly Germany, Sweden and Norway) 138 tons 17 cwts.

Strawboards: Total from all sources (mostly Netherlands, Germany, U. S. A., and Belgium), 10,696¼ tons.

Millboards: From Canada, 175½ tons; Netherlands, 153 tons 6 cwts.; Germany, 204 tons; Sweden, 649 tons 17 cwts.; Belgium 7 tons 18 cwts.; Norway, 138 tons 12 cwts.; Finland, 596 tons 4 cwts.; U. S. A. 247½ tons.

These figures show a month's shipments to the English and Scotch ports. I have time and again pointed out that it is strange Canada does not do something to capture some of the strawboard trade. At present it is in the hands of a few foreign countries.

British Fair.

The eighth British Industries Fair is now open in London and at Birmingham and exhibits from 1,400 firms represent practically every British industry of note. Buyers are present from America, Canada, and various parts of the world.

In the paper, cardboard, and wallpaper sections, there is a good display of anything from envelopes to filler papers, newsprint, dyes, chemicals, and boards. The Limehouse Board Mill, London, show their goods made up into boxes. This firm, like other firms within recent years, is developing the container side of their mill and the proprietors report plenty of work on hand.

The list of paper makers, merchants, and agents, shewing the specialties of their industries, is a long one, but it cannot be said that there is anything new. The display is mostly to attract buyers, get business, and let people see what they can make.

The Fair is a great success from every point of view. One notable feature is the use of a particular mantle, or globe, in electric lighting which enables colors to be clearly matched at night-time. It is a light equal to day light and in paper mills should be most useful.

School Exhibitions.

At this period of the year the technical schools generally have a little display of their work. I have just concluded a tour round some of the principal schools in London and I was greatly struck with the success the paper classes have achieved. The great thing about these schools is that the young people who attend them come under the direct influence of a specialist who knows papermaking from A to Z, and the practical training is obtained at the mill, or whatever branch the pupil is going in for.

Today in England technical education is on its ''trial''. The Government want to cut the expenses of Education down and the educationists, backed by the Universities and teaching professions are up in arms against any ''cut.'' The bad and good points of technical education are, therefore, being trotted out in ''double quick time'' and the newspapers are full with protests. Sir Walter Runciman in a speech the other day said: ''Our national duty was never clearer. It was that we should add to the brain power of our population in every grade and every class. We could not afford to have any of our great concerns in the hands of men of mediocre ability.'' He advocated a business training with a technical training as each was useless without each other. British paper mills owe much to the technical school and technical teaching.

Wages and Hours Dispute.

Negotiations are still proceeding between the Workers' unions and the mill owners. I understand nothing definite has been reached, but a good deal of misunderstanding has been removed on both sides. The workers, however, are not leaving anything to chance; they are getting a strike fund ready in case it may be wanted.

Research Work.

The indefatigable secretary of the British Papermakers Association (Mr. A. W. Foster, B.A.) has been delving into the history of the papermaking machine and he contributes a valuable reference on the Cameron period in Part I, Vol. II of the Technical Section proceedings. The subject has been followed up since and the Technical Section have own secured drawings of the Cameron machine for use in the industry.

Scandinavian Newsprint.

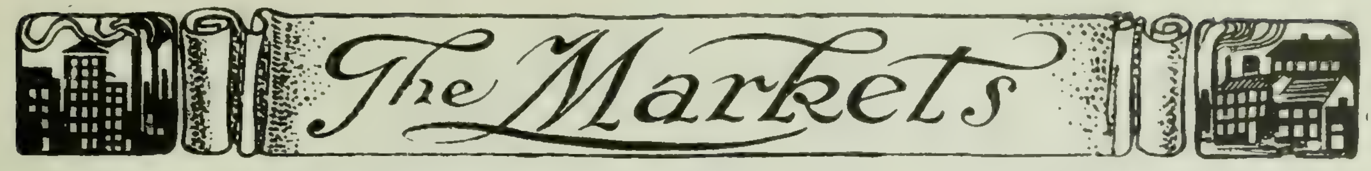
It is stated in London that the Scandinavian newsprint mills have plenty of orders on hand and if local conditions were more satisfactory in regard to labour they would operate more than full time.

As a sign of getting back to pre-war days the London ''Times'' announced this week that the price would be 3 cents instead of 6 cents. This is interesing from a newsprint man's point of view. Canadians and Newfoundland people are interested in the output of the ''Times.''

New Zealand Tariff.

The new paper tariff which New Zealand has adopted is published this week by the Board of Trade. There are preferential rates for British manufacture. I would advise Canadians to secure a copy at once. It was to be expected New Zealand would come out with some kind of tariff like the recent Australian preference announced for British newsprint.

Brown Brothers, Ltd., Toronto, have been appointed sales agents in Canada for Marvellustre, the new paper of the Marvellum Co, Holyoke.



The Markets

CANADIAN TRADE CONDITIONS.

Montreal, March 21.—The feature of the week in the paper trade is the reduction in the price of writings, bonds, and books. There are some slight reductions in the higher grades of bonds, and some minor changes in the cheaper grades of book and writing papers. We understand that the reductions average from a half cent to one cent per pound. The reports from all quarters confirm previous statements of a revival in business,—which will no doubt be further stimulated by the lower schedule of rates, which went into effect last week.

The statement made at the annual meeting of the Howard Smith Paper Mills, Limited, was of a decidedly encouraging character, especially as it indicated that the increase in business is widespread as regards points of origin. Wrappings are in fair demand, and tissues are selling very well.

Cable advices from Australia are to the effect that the severe competition for fine papers continues, and that British firms are quoting some very low prices.

The Canadian Export Paper Company announces that contracts for the supply of newsprint by the mills represented by that concern have all been renewed for the second quarter of 1922 at the old price of $70 per ton f.o.b. The general opinion is that $70 has been established as the basic price for a long time to come, conditions working to that end. Naturally, manufacturers will welcome this indication of the price being on a stabilized basis. It is significant that the Hearst organization, which ordinarily requires about 250,000 tons per year, has quite recently made two or three firm contracts for additional Canadian paper spread over a year, that could only be used to displace paper formerly obtained from Europe. As showing the importance of securing paper from reliable mills, even at a small increase in price, we may mention the experience of a well-known New York publisher, who ordered 500 tons of German newsprint in one shipment, only to find that it could not be used. American buyers are now stipulating that the paper ordered from Europe must come up to their requirements and be shipped at the exporter's irsk. All circumstances in the States are tending towards the resumption of conditions prior to last year, when American buyers depended upon Canadian and American production.

Pulp is a quiet market. There is practically no sale for groundwood, the American mills having abundance of water. Sulphite is dull, with a few more inquiries.

Pulpwood is almost without buyers. The reports from Quebec are to the effect that little wood has been cut this season, and that dealers in that city cannot sell their stocks. Although the greater activity in the Canadian mills is reducing the wood piles — (mostly purchased at high rates) — more quickly than was anticipated, the stocks are still very large.

As Toronto Sees It.

As far as paper consumption is concerned, the printers' strike has ceased to be a factor in the market situation. Most of the local establishments have an almost complete complement of men.

One of our large jobbing houses, selling entirely to printers and handling bristols, writing and coated stock, is carrying on a campaign in which the chief point is that there is a paper made in Canada to meet every requirement of the printer. Reports indicate that the campaign is bearing fruit. It is remarkable that firms outside of Canada can come in here and get business in the face of duty and exchange. Evidently one reason for this is ignorance on the printer's part that he can get all he wants in stock produced at home. Even blotting of excellent quality in now on the Canadian market from a Canadian mill.

The present situation differs little from that of last week. The number of sales does not vary greatly, though tending lower in some lines. The individual sales are small in quantity. One maker in conversation expressed the view that there is a feeling among buyers that bargains may be had by waiting; hence the small orders, and in one or two cases this appears to be brought about by a tendency to reduce prices. In circumstances such as those before us, it is natural to expect the producers to make prices as low as possible to encourage business. It is scarcely logical, therefore, to look for lower prices from any sound business house when the market, both buying and selling ends of it, is fully seized of the fact that consumers' stocks are low. Are we not coming to the time when the hold-off buyer will realize he has held back too long, and will begin those old tactics of feverish buying? Jobbers cannot afford to carry heavy stocks and mills cannot store much. Is not the consumer, small or large, the man to relieve the situation? There are increasing uses for paper and a higher individual consumption. Periods of stress and strain are not due so much to wide periodical variations in quantities used by individuals but to unevenness in distribution.

There is in all branches of industry here, a general sense that, while steady small increments of business are to be expected from now on, the situation will show no marked improvement unless there is an active building revival, and good crops.

Pulpwood. — Settlers' wood, not peeled ,on cars at siding is quoted at $4.50 to $5.00 per cord, while peeled wood, delivered at Ontario points, is $17.00 to $18.00 per cord.

Groundwood.—News grade is quoted at $25 to $30, and book grade at $35 to $40.

Sulphite at the mill brings, for News grade, around $60, Book grade $70, and Bleached grade $100.

Sulphate pulp is quoted at $70.00, but this market is featureless.

Writings. — A general reduction of about 10 p.c. took effect recently, but the market is quiet in this district.

Bristols. — Prices are maintained ,though demand has fallen off somewhat in last couple of weeks.

Covers. — There is varied activity.

Tag. — That the market is unsettled is indicated by a wide range of prices.

Wrappings are as follows:— Kraft, $8.75 per 100 lbs. No. 1 Manilla, 7 1-2c. carlots Toronto; Fibre Manilla 7 1-4c. carlots Toronto; B Manilla, 5 3-4c. carlots Toronto.

Board. — Mills are quiet, but anticipate a fair business.

Paper boxes are spotty. At present there is some activity, but not traceable to any particular cause.

Bags. — Base prices remain unchanged.

Paper Stocks. -- Prices given are per 100 lbs.

No. 1 Hard white shavings	$3.60
Soft white shavings	3.00 to 3.25
Heavy books & Magazines	1.35 to 1.45
Ledgers & Writings	1.65 to 1.75
Newspapers	.75 to .80
Mixed Papers	.55 to .60

Rags, inclined to stiffen, prices not available.

NEW YORK MARKETS.

New York, March 18.—(Special Correspondence) — Business in paper during the present week has been principally along routine lines with the market as a whole displaying little change of importance. Reports generally tell of demand undergoing some expansion but the improvement is slow and trade activity is still considerable below normal. Buyers evince a lack of disposition to absorb other than supplies directly required, in consequence of which the bulk of orders placed with jobbers or mills are of the small-lot variety. Paper merchants in New York say they are receiving a fairly large number of orders but that the volume is small and that the aggregate amount of business being done is nothing approaching that of busier times.

From all accounts, consumption of newsprint is keeping up at a fairly heavy rate, and print paper is meeting with a consistently good demand. Publishers are careful in placing orders, taking care not to enter commitments for any large tonnage of paper which they are not sure of needing, nevertheless there is a steady demand both from contract and transient sources and newsprint is moving into consuming channels in gradually increasing amounts. Mills all over the country are finding it necessary to quicken their production to take care of the extra orders drifting in and newsprint plants are reported on high authority to be operating at a better rate of capacity today than in some time. Foreign competition seems to be on the decline; it being said that in numerous cases American publishers are becoming disgruntled over the slow deliveries by European manufacturers, and are therefore looking more to domestic producers to cover their wants.

Spot prices on newsprint in standard rolls are ranging slightly above the contract basis, which means that most transient sales are at around 3.75 cents a pound f.o.b. mills. Sentiment among newspaper publishers appears to be fairly well satisfied with prevailing prices of print paper and there is little reluctance shown in meeting the quotations named insofar as concerns the tonnage required. There is a fair call for side runs, which are quoted at 3 cents per pound or a little higher at mills.

The wrapping paper market is exhibiting somewhat more life though consumers are still cautious buyers. With the pre-Easter shopping season well on the way, however, some retail merchants apparently are laying in supplies of wrapping paper, thus making for a better allround demand. Quotations on No. 1 domestic kraft wrapping range fron 7 to 7.50 cents a pound f.o.b. New York, with now and then a sale reported at a trifle below 7 cents.

Book papers also are moving a little more freely although chiefly in small lots. Printers and publishers are absorbing supplies against direct requirements yet are gradually increasing the number and tonnage of orders. Prices display a steadier tone, with machine finished book quoted at around 6 cents f.o.b. consuming centres, super book at about 6.50 cents and coated book at from 8 cents a pound upward.

Box boards are being accorded more attention by consumers who are experiencing improved conditions in their own fields and who consequently are purchasing larger amounts of boards. Prices rule steady at $40 a ton f.o.b. New York on filled news board, and around $37.50 on plain chip board.

GROUND WOOD. — While there is nothing of an exciting nature about the mechanical wood pulp market, there is a fairly consistent demand from consuming quarters and a medium business is going through daily. A feature this week has been sales of Canadian ground wood brought down from Nova Scotia to New York in schooners and sold ex dock at this city at higher prices than have previously obtained. Fair-sized lots of ground wood have been sold in this connection at $34 and $35 a ton New York, which figure out to cost consumers around $40 per ton delivered, or, in some cases, as much as $42. Domestic producers quote at about a basis of $40 to $42 per ton delivered at consuming points, which means f.o.b. grinding plant prices are in the vicinity of $31 to $32 a ton.

CHEMICAL PULP.—The most interesting development in chemical wood pulp is the report that complaints have been filed with the United States customs authorities that Canadian pulp is being dumped into the U. S. market. Quite a number of instances of alleged dumping have been brought to the attention of the Washington officials, who, it is said, are conducting an investigation into the matter, and who, it is stated on very good authority, have not been able thus far to procure any proof that pulp is being dumped from Canada. Some rather humorous stories are being related in the pulp trade concerning complaints which have been filed with the customs officials of certain lots of pulp being sold by Canadians to American buyers at surprisingly low prices, which, upon investigation, have proved to be pulp of very low quality and not worth even as much or certainly no more than the prices received for it.

The pulp market shows little change and sales are scattered and mostly of light volume. Prices are holding moderately steady though now and then reports are heard of sales at concessions, which are to be expected with present circumstances prevailing.

RAGS.—The market for papermaking rags is a quiet affair. Consumers are doing little wholesale buying and are generally managing to get such lots of rags as they want at very nearly their own prices. The situation cannot be called disorganized, but there is no question that an easy tone exists and that dealers in frequent instances are disposing of stock at sharp consessions in price. Roofing rags continue to move downward in value. Felt mills are buying in piecemeal fashion and are getting No. 1 roofing rags at around one cent per pound at dealers' shipping points and No. 2 packing at as low as 85 cents a hundred pounds. There has been a little run of demand on No. 1 white shirt cuttings and sales of this grade of rags at around 9.75 cents per pound at dealers' points have been noted. Old whites are in slack demand, and old blues are neglected.

PAPER STOCK. — Another rather quiet week has prevailed for waste paper. Some of the low grades have been in fair demand, and prices on these descriptions hold steady, but most of the high grades are in less call and quotations in these instances have slid off a bit further. No. 1 mixed paper, which is used principally by box board mills, is in comparatively good demand and is selling at 50 to 55 cents a hundred pound f.o.b. New York, while old folded newspapers are moving in fair volume at 60 to 65 cents a hundred

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pounds. Old book stock also holds up in price at between 1.40 and 1.50 cents per pound, whereas shavings display a downward trend, with sales of No. 1 hard white shavings reported at 3.85 cents f.o.b. New York and of No. 1 soft white shavings at 3.15 cents New York. Old kraft paper is steady at around 1.85 cents a pound.

OLD ROPE AND BAGGING. — There is a fair call from paper mills for old bagging and sales are reported at one cent per pound f.o.b. New York on No. 1 scrap bagging, and 75 cents a hundred pounds on roofing bagging. Old rope is in scattered demand and is seldom fetching better than 4.25 cents a pound at dealers' shipping points for domestic manila rope in No. 1 condition. Mixed strings hold steady at 90 cents to $1 a hundred pounds at dealers' points.

"C. F.-M." AND THE PAPER INDUSTRY.

"Canada's Departmental House for Mechanical Goods and Engineering Supplies". Such is the name frequently given to the Canadian Fairbanks-Morse Company, Ltd. It is quite impossible, within reasonable limits of space, to give a comprehensive account of all this concern's various lines and machinery. But it may quite truly be said that there is scarcely an industry which does not make profitable use of some of its almost innumerable labor-saving appliances.

Few, if any, Canadian concerns, apart from the pulp and paper mills, play a more important part in the production of Canda's paper than The Canadian Fairbanks-Morse Co. Limited. At the first glance, it is doubtful if the layman would associate the Canadian Fairbanks-Morse Co. with Canada's paper mills, but those who are engaged in the manufacture of pulp and paper, appreciate what an important factor this organization is in their business life.

Years ago, in the early days when the pulp and paper industry was still comparatively in its infancy, the Canadian Fairbanks-Morse Co. realizing the tremendous future for the industry and to what vast proportions it might attain, at once took steps to place themselves in a position to meet the ever increasing demand for machinery and supplies.

The fact that the pulp and paper industry from the time of cutting the pulpwood to the finished product, involves so many operations and extends over such a range of territory means the utilization of a tremendously wide variety of mechanical equipment and supplies. To meet this condition, the Company, although manufacturers of considerable magnitude, and operating modern factories of considerable proportions, have reached out and secured the representation of many other lines not manufactured by themselves. The uniformly high quality of The Fairbanks-Morse Co. products necessitates care and judgment in the selection of the other lines to be offered to the industry in conjunction with them; in order that the high standard may be maintained.

The giant strides made by the pulp and paper industry, in improved methods of manufacture have made the selection of modern equipment of high quality a matter of first importance, and it is for this reason that the many trading lines controlled by Canadian Fairbanks-Morse have placed this Company in the enviable position it occupies to-day.

With Branch Sales Offices and Warehouses in every important centre throughout Canada it is possible for the concern to make quicker shipments than would otherwise be the case, and this fact is fully appreciated by those engaged in the pulp and paper industry. The responsible heads of Branch Offices and Departments are in all cases fully qualified to advise purchasers. Many of these men are, in fact, graduate engineers of considerable experience.

One naturally associates Scales with the name "Fairbanks". Track and dial scales form no small part of the firms equipment installed in Pulp and Paper Mills. Other lines which are in demand by the industry and supplied by The Canadian Fairbanks-Morse Co. include such well-known products as Rogers' Wet Machines, Claflin Beaters, Wood's Pulp Thickeners, Allen Engines, Nash Pumps, Graton & Knight Leather Belting, Dick's Original Balata Belting, Robert's Pulp Stone Burrs, and trucks speially designed for paper mills. Valves, of course, constitute an important part of The Canadian Fairbanks-Morse Co's smaller lines, and this Company supplies a large percentage of the valves used in the Pulp and Paper Industry in Canada.

Many other prominent lines carried by the firm might be mentioned to emphasize still further their position to meet almost any demand. For instance—Foster Regulators, Durabla Packing, Pipe and Fittings, Strong Steam Traps, Portable Forest Fire Pumps, Oil Engines in various types and sizes, Fairbanks-Morse and Gould's Pumps, Motors and Generators, Machine Tools, Wood Working Machinery, Transmission Appliances, Sprocket Chain, Railway Equipment, Concrete Mixers, Small Tolls and Machine Shop Supplies, Yale Chain Hoists, Norton Grinding Wheels and Motor Boat Supplies.

In view of this wide range of materials supplied to the pulp and paper industry by The Canadian Fairbanks-Morse Co. there is no question as to the importance that the organization plays in this field.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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EDITORIAL

IS IT DUTY OR EXPEDIENCY.

It seems that there is a disposition on the part of the United States Congress to impose a duty on imports of woodpulp. It seems to us this is a little bit like rubbing it in. A large part of the woodpulp produced in the United States is manufactured from Canadian wood. The situation rather reminds us of a trick we used to play. The idea was to ask the uninitiated boy to squat and endeavor to see how far forward he could reach by putting his hands under his knees from behind and stretching them forward. This gave an excellent opportunity for the joker to grasp his hands and spill him on his back. Something like more than a million cords has been the average import of pulpwood into the United States for the past eleven years, the largest amount being 1,370,000 in 1916. The total U. S. consumption is between 5 and 6 million cords. The value has steadily increased furing the last six years and is now worth twice as much per cord as in 1916. This makes pulp to compete with our pulp.

The idea of an import duty on woodpulp may ostensibly be the protection of American pulp mills from low priced imported products but those who fear anything like a dumping of Canadian pulp in the United States may rest assured that Canadian producers are perfectly willing to take just as much for their product as the American pulp maker asks for his. If there are any Canadian pulp mills that are making much more than a bare profit at the present time, we should like to know who they are. Canada is the only country in the world that maintains standards of wages and living on an equality with those in the United States or anything like it, and the maintenance of these standards is what makes production costs high and keeps them practically the same in the two countries.

The 600,000 tons (approximately) of Canadian pulp sent to the States uses just about as much of our wood as is shipped out in the raw state. Perhaps the idea of the tariff is to induce the import of more Canadian wood and less pulp.

It seems to us that a duty on Canadian pulp will tend to put a very considerable premium on the value of the remaining supplies of pulpwood in the eastern states and will enable the pulp mills across the line to bid considerably higher for Canadian pulpwood. This will encourage still further, the already serious rate of over-cutting of our forests and will clean off free-hold Canadian timber without leaving anything like proper compensation in this country for the injury that will be done our wood-using industries. Such wholesale slaughter of these lands as will be likely to result during the next 10 or 15 years, will not only clean off potential supplies for Canadian industries but will create fire and other hazards altogether out of proportion to the benefit derived. In fact, even now we believe it well within the mark to say that pulpwood cut on free hold lands, a very large proportion of which is exported, does not bear its fair share of the cost of protecting and maintaining our forests in a productive state.

We have written before on the subject of an export tax on pulpwood and we feel that this step cannot be taken any too soon, whether our friends to the south do or do not decide to put an import duty on our pulp.

From the sidelines, the situation looks as if Jack Canuck were squatting with his hands out stretched in front and Uncle Sam about to topple him over as far as regards the opportunity of supplying American paper mills with woodpulp which they must have for their operations.

THE PROTECTION OF PLANTS.

There is a society called the Quebec Society for the Protection of Plants and the editor had the pleasure of attending their annual meeting last week. This is not a very large society but it is one of those organizations which has a very healthy influence in directing public opinion to problems affecting our everyday life. The program of the meeting this year included several excellent papers on the forest and its problems of protection. It is encouraging to know how many of the prominent biologists, entomologists and botanists of Canada are interested in this subject and it is interesting to hear them talk of the work that is being done. Canada is far more indebted to the college professor and the scientists of government departments working quietly but faithfully at his chosen profession than most of us realize.

Dr. Swain, who is well-known to many pulp and paper men, spoke of the enormous losses from the spruce bud worm and the ravages of borers and fungus which follow the weakening of the tree through its defoliation. Dr. Swain estimates that Canada has lost at least one billion dollars worth of timber in the last score of years. The loss from bud worm in Quebec alone in the present attack is about 150,000,000 cords, or 30 years cut for the whole Dominion. His associate Mr. Dunn put the loss from the bud worm in New Brunswick in a slightly different way by estimating that the amount of timber killed would have built four rows of seven room houses entirely across Canada allowing 20 feet between houses. It was pointed out that in order to salvage wood that has been killed it is necessary to take it out promptly.

One of the most interesting features of the work of the forest pathologist is in methods of control of epidemics in the forest. It has been definitely shown that certain kinds of insect attack can be absolutely controlled. It costs money to do it but the money spent in this way is an investment which brings much return.

Dr. C. D. Howe spoke on the present conditions of our forest management with a view to future reproduction. In outlining some problems in forest pathology, Dr. J. O. Faull told of one or two amusing incidents which it might be worth while to repeat. He is known as the Tree Doctor by the half-breed Indians and campers who inhabit the district where he does his work in the summer and the half-breed who has been his guide for several seasons, confided to friends in the village that although the doctor had been going there for several years, he could not see that the trees were any better.

One day as Dr. Faull was working quietly inspecting trees which had been examined a year before, a guide with a fisherman passed nearby and the guide was over-heard to say, "There the doctor is now," and the fisherman remarked as he looked around the limitless forest, "Well, he has a hell of a big practice any how!"

There is no question whatever but that the forest pathologist has a big practice. It is almost discouragingly big, but science is winning the fight, nature's secrets are being discovered and what is even more encouraging, there are those who have sense enough to put the knowledge of nature's secrets to work for the advantage of this and future generations of Canadians by beginning now to manage their forests according to scientific principles, so we say "more power to the tree doctor and all the others who are paving the way for a permanent, productive, and profitable future for the industries based on Canada's forests."

COBWEBS.

On another page of this issue there is mention of the presentation of the shield for the winner of the class B. Safety Contest of the Ontario Pulp and Paper Safety Association. The outcome of this competition marks one of the most important steps recently taken in the Pulp and Paper Industry. The almost miraculous record attained by two mills, each of which had only one lost time accident during the whole year of 1921, shows what persistent education and cooperative effort can do along this line. We trust that this is only the beginning and that each year will see twice as many clean records as the year before. We even hope to see the time when the custody of the shield will have to be divided and more than one flag presented to the mills that will come through without a single accident.

New Zealand has a new tariff act which provides three classes of duties. Preferential rates will be granted on goods originating anywhere in the British Empire, intermediate rates are to be applied to products of such countries as may enter into reciprocal tariff relations, while a third class will take care of all others. It is very gratifying to note that Canada, by virtue of her membership in the British Empire, falls in the preferential class. This is particularly important as New Zealand is a very good customer of our pulp and paper industry and the consideration given to the New Zealand market under the trying circumstances of the war, shows that the friendly disposition on the part of New Zealand customers is fully appreciated in the Dominion.

The many pulp and paper makers who had the privilege of becoming acquainted with Mr. Paul Jouanneau during his visit to Canada and the United States last summer, will be pleased to hear that his home has been made happy by the advent of a son.

It is easy to say what you would do if you were President, but did you ever try to dope out what the President would do if he were you?—The Atlantic Reflector.

It is very gratifying to note reports of a substantial increase in employment in the Pulp and Paper Industry.

Many who are not on the job all the time find themselves out of a job in no time.

The more a man enjoys his work, the more he enjoys his leisure.

A man is like a tack. He can only go as far as his head will let him.

THE FLOWER GARDEN.

What they say about the Textbooks.

"We feel that this is a very valuable work that you are doing in editing these text books and wish you every success in the preparation of the last volume of the course and in future editions."

"I have received volumes 1 and 2 and they are very much appreciated. I consider them well worth the money and I may say that volume 3 will be welcomed when it arrives."

ORDERS ARE COMING IN.

Orders continue to come in for the texbooks on the "Manufacture of Pulp and Paper. Volumes 1 and 2 have met with hearty appreciation of their value, and volume 3, which deals with the Manufacture of Pulp, has had the sincere commendation of those who have seen the proofs. This volume will be off the press in about a week. It will be delivered anywhere in Canada on receipt of $5.00 to those who have ordered the set and paid for volumes 1 and 2. See order blank, page 269.

Electrical Development for the Pulp and Paper Mill.

By R.W. LEEPER, Powei Engineer

H. S. TAYLOR LIMITED, Montreal, Quebec.

In the series of articles of which this is the last, several members of the staff of H. S. Taylor, Ltd., have shown the broad service that a complete engineering organization can render the Pulp & Paper Industry. They have pointed out some of the specialized problems.

Electricity in the form of power first became a factor in the Pulp and Paper industry about 1900 — and during the past twenty years the advancement of electrical development has been remarkable. From the first major installation of less than one thousand kilowatts capacity, the demand of the individual mill has increased until at present there are several installations of approximately ten thousand kilowatts, and a few still larger, the average capacity being far in excess of the first important development. We can attribute this advancement principally to the two following reasons.

First. — Power could be electrically distributed and applied thruout the mill and with greatly increased economy over former methods.

Second..— The development of electrical equipment suitable for the service demanded.

The major advantages of applied electrical power over former methods, are briefly as follows:

1st. — Centralization of power generating and distributing equipment under the control of a few skilled operators.

2nd. — Two or more generating units may be installed, thus preventing a complete shut down in case of trouble. Further, more economical operation is a result at partial loads.

3rd. — The power from several small developments may be combined and successfully applied.

4th. — The manufacturer's plant may be placed in the most advantageous position, irrespective of location of power plant.

5th. — The mill buildings may be arranged to reduce to a minimum the handling of the product, without reference to power supply, thus reducing conversion costs.

6th — Extensions to present mill where power supply is exhausted is allowed through ability to secure additional power from outside sources.

7th. — Elimination of unnecessary line shafting and belting reduces friction loss and the personal hazard.

8th. — Equipment may be operated to secure maximum production with minimum power consumption.

9th. — Distribution can be so arranged that troubles in one department will not interfere with another.

10th. — With proper sub-division of distribution, power is consumed by a department only when in operation, therefore greater economy of its use is possible.

11th. — The power consumption of an individual motor, or for a particular operation may be accurately determined at any time or continuously for cost purposes.

12th. — A cleaner, better and more uniform product is a result.

The majority of pulp and paper mill equipment, in earlier years was mechanically driven by water wheels or a combination of steam and hydraulic units. Power, as a rule, was transmitted to the various machines through a complicated system of gearing, line shafts, rope drives or belts, the prime mover being direct connected in but a comparatively few of the many different drives. The friction loss for such drives is usually assumed to be about 15 per cent., and this figure is approximately correct under ideal conditions, such as correct shaft and bearing proportions, accurate alignment and proper belt tension. Ideal conditions, however, cannot be maintained and the friction loss, while indeterminate is always greater under load, and is usually higher than the assumed figure of 15 per cent., a safer estimate for this loss being at least 25 per cent. and it may be even higher.

The first motor drives naturally followed closely the former methods, the motor replacing the engine or water wheel, as the case might be, the mechanical transmission to a great extent being retained, and often where installed in existing mills the former prime mover was held in reserve to pick up the load in case of trouble. With the growing appreciation of the reliability, economy and high efficiency of motor drive the applications increased, the requirements of individual machines were accurately determined and where necessary special equipment was developed suitable for the service to be performed.

In the application of motors, two systems are in general use which are commonly known as "group" and "individual" drive and for each installation the relative merits of the two systems must be determined. Group drive is usually selected where there are a number of small units, all of which must run at the same time, the shut down of any one affecting or interrupting the process. Such a number of units can be grouped and driven from a line shaft to advantage, a good example being the constant line of a paper machine. Such an arrangement is also preferable for a line of duplicate machines such as wet machines, screens, deckers, etc., where individual motors would be both expensive and unnecessary.

Individual drive is preferable where the duty is intermittent, or where the driven machine is a complete unit in itself, as power is consumed only when the unit is in operation, and no interference can be caused through operation of other equipment. Super-calenders, Pumps, Jordans, and Grinders as a rule are in this class. In that it is generally admitted that more minor interruptions to service are caused by trouble with the control equipment, than with the motor itself, especially in the lower ratings, serious consideration should be given to too strict adherence to the principle of individual drive.

Alternating three phase current has been found, after many years practical experience, best suited for industrial power application and is almost universally selected today for the Pulp and Paper mill. By its use power, either in small or large quantities, can be economically distributed over large areas, it can be readily transformed so that proper voltages are available for various applications, the equipment is simple, and even if operated continuously under extreme conditions, affords maximum reliability and high efficiency with minimum maintenance. The current carrying parts may be totally enclosed, permitting the use of higher voltages without endangering the operators, thus reducing distribution losses and increasing efficiency; the efficiency of a properly designed alternating current installation being at least 80 per cent from the shaft of the prime mover to the driven equipment, not including losses due to long distance high tension transmission lines where required. This efficiency can also be maintained as it is not affected to the same extent by line shaft and belting conditions, as is a purely mechanical system of distribution.

Alternating current motors are especially suited to the service encountered in the Pulp and Paper Industry where reliability is the first consideration, and where the greater percentage of drives are of the constant speed type. The first cost is low, the parts are few in number and built to withstand hard usage, the electrical characteristics are such that high efficiency is obtained over a wide load range, the windings may be impregnated to resist moisture or acid fumes, and for the types most used a commutator is not required, thus reducing materially the fire hazard. For Pulp and Paper mill drives, three types of alternating current motors are used, commonly known as squirrel-cage, wound-rotor or slip-ring, and synchronous.

Selection of Type of Motor.

The squirrel-cage motor is selected where constant speed with moderate starting torque is required which includes the majority of paper mill drives such as Pumps, Jordans, and Chippers.

For those drives where high starting and pull-out torque with constant speed is demanded, the wound-rotor or slip-ring motor is preferable. In this class may be included drives for Beaters, Conveyors under load, and heavy line shafts. Super-calenders are now being driven with slip-ring motors, this application however demanding the varying speed type in place of constant speed. Slip-ring motors are more complicated and expensive than the squirrel-cage type, but for heavy duty this additional expenditure is fully justified.

The modern synchronous motor can be selected for Grinders, Jordans and Motor-Generator Sets where of appreciable capacity, the proper application and use of which will improve the power factor, thus increasing the efficiency and capacity of the entire system. It is true that either static or synchronous condensers may be used for this power factor correction, but the initial cost is materially increased thereby.

Direct current in the average mill is confined to those drives where a wide variation of speed is demanded and to certain electrolytic processes necessitating the use of continuous current. It is usually the case, however, that this direct current is supplied from the alternating current circuit through either a motor-generator set or other form of converter.

The use of direct current motors in the mill is generally confined to the variable speed end of paper machine, if electrically driven, the winders, cranes and certain finishing equipment where a wide speed range is required with uniform speed at any point regardless of slight load changes. For such application, adjustable speed, direct current motors are preferable and show distinct advantages over the alternating current type.

The development during the past few years of synchronous motors of high rating for driving wood pulp grinders, has advanced rapidly. In the earlier mills, grinders were almost universally driven by direct connection to water wheels, and while this arrangement is unquestionably efficient, its disadvantages more than offset the saving from either an efficiency or initial cost standpoint. With grinders direct connected to a water wheel the groundwood mill must be located with reference to the water power, even if completely isolated, and therefore may be entirely unsuited from the manufacturing standpoint of its own operation or that of the conversion plant that may be a part of the development; it is frequently found that the available head is not suitable for developing the standard grinder speed, and lowered efficiency and loss of water must result. With electrically driven grinders, location can be selected irrespective of power source, power units can be selected of the highest efficiency, and what may be the most important of all, grinding capacity is not limited to the one source of power, any outside source being available for enlargement. It is also admitted that the modern magazine grinder, which is coming more and more into general use, can not be successfully operated except electrically, its high power demand and necessity for speed control being unsuitable for direct connection to a water wheel except under very unusual conditions.

For the first motor driven grinder installations wound-rotor motors were as a rule selected, the starting characteristics and general development of the synchronous type not being suitable for this heavy duty, although the efficiency and first cost were usually in favor of the latter type. With this grinder application in view however, together with the demand for synchronous units to improve the exceedingly low power factor conditions prevalent throughout the industry, this lowered power factor greatly reducing the capacity of the generating equipment or being the cause of heavy penalties in the case of purchased power, the electrical manufacturer's attention was directed to the synchronous unit with the result that today the synchronous motor is usually selected for driving grinders, both of the magazine and protect type, its uniform speed and general charactehistics adapting it for this use as well as for other locations where a single unit of higher rating is demanded.

Motor drives for the variable speed shaft of paper machines are not common, the non-condensing engine for many years having been the standard installation, and it probably will be for many years to come, from a steam economy standpoint where the entire steam demand is for drying and heating. Under such conditions the steam engine provides an extremely efficient drive and there is little chance for improvement. In mills, however, where the entire power demand is generated with steam or where centralization of power is desired, a motor driven variable line may be operated advantageously, an adjustable speed direct current motor replacing the steam engine and we find today many paper machines being so driven.

This adjustable speed direct current motor drive with a speed range selected for the machine that it is to drive, is in many ways an improvement over former methods, as it has, in eliminating many complicated and unreliable speed changing devices, also eliminating varying speeds on the paper machine. It has not, however, eliminated the back line, belts, cone pulleys and gears, or reduced the loss between prime mover and machine, which is often as high as 50 per cent. of the total power developed, nor has it improved the lack of uniformity between the various sections, to which many breaks can be traced, or reduce maintenance on the back line which is from 20 to 30c. or more per ton of product?

With the demand for higher and still higher machine speeds, increased production and lower operating costs, the problem of maintenance and successful operation of the variable speed drive became more serious until the limits of former types was reached. For several years electrical manufacturers had been experimenting with various schemes by which it was proposed to drive each section with an individual motor, which was an exceedingly difficult problem on account of the close regulation required between sections often over a wide speed range. At present it can be said that the problem is solved, as there are today three different types of sectional individual drives in successful operation. This development eliminates all line shafting, rope drive, belts, gears, clutches and cone pulleys, and provides maximum reliability with minimum maintenance, high efficiency and perfectly adjusted draws between sections, the maximum speed at which the machine may be operated is enormously increased. The sectional drive is applicable to slow speed as well as high speed machines, and while it is not an actual necessity for the slow speed machine, it is the general opinion that its installation is justified.

For either a single motor or sectionally driven machine, where the speed range is greater than about 3 to 1, voltage control or a combination of voltage and field control should be used, this arrangement requiring an individual generator for each drive, and even where the speed range is such that one generator may be used for two or more machines it may be advisable to install a generator for each machine, to avoid interference with but one unit in case of generator trouble. The generator in this arrangement is usually driven by a non-condensing steam prime mover or coupled in a motor generator set, exhaust steam in the former case being supplied to the dryers, and in the latter this steam being furnished direct from the boilers or from an extraction turbine if this type of equipment be installed.

For those installations where the entire power demand is generated with steam, or where several machines are electrically driven, the extraction or bleeder type of turbine generator set is especially suited, low pressure steam being available upon demand, and not supplied irrespective of demand as is the case of the back pressure unit. This characteristic is of special value during wash-up or other periods or when breaks occur or for other causes the dryer steam is shut off the paper machine. Steam from a turbine is also unquestionably superior to that from an engine for drying and heating purposes on account of being absolutely free from all oil which when present, not only reduces the heat transfer in the dryer, but is a constant menace when the condensate is returned to the boilers from which the oil cannot be entirely removed by any known method. Before selecting a turbine of the extraction type, conditions must be carefully analyzed as it obviously cannot be used where the demand for exhaust steam is nearly equal to or greater than due to the load demand.

In the field of auxiliary equipment, such as switching, starting and control, developments have been in keeping with the major apparatus. From exposed knife switches and unsatisfactory fuses, the control has been improved until today all alternating current equipment, even of low capacity, can be protected by oil circuit breakers or similar devices with relays of suitable type. Fuses are still installed for cable protection or to take care of abnormal conditions in the distribution system, but they are not, however, depended upon except indirectly to protect equipment. With modern control all current carrying parts are enclosed so that accidental contact due to careless operation, is practically impossible. New resistance metals and insulating materials have been developed, rheostats, relays, contactors, controllers, etc., made more rugged until these parts give little trouble, even in paper mills, where control equipment is often exposed to moisture, acid fumes, extreme temperature changes, and under the control of an operator unskilled in its manipulation, and under these conditions the continous operation given shows to a remarkable degree the development that has taken place.

For many years the standard temperature guarantee for electrical equipment was for full load, continuous, 40°C. rise; with 25 per cent. overload 2 hours, 50 or 55° C. rise, based on an ambient temperature of 25°C. For several years manufacturers of electrical equipment have standardized more and more on a continuous full load rating of 50°C. rise, with no overload, based on an ambient temperature of 40°C. (104°F.). The capacity of equipment rated on the 50 deg. continuous basis is approximately 83 per cent. of the former 40 deg. basis. For some time generator and transformer guarantees have been made on the continuous basis, and for motors this guarantee is now becoming common in the United States and quotations are usually so based unless otherwise specified.

From the manufacturer's standpoint, there are several good reasons for the continuous rating. With the development of better insulating materials, iron of superior electrical characteristics, improved ventilation and design, it is possible to determine accurately the carrying capacity and safe temperature limits. It has also been found that deterioration of the insulation is not increased by operating at high temperature as long as certain safe limits are not exceeded and in many cases modern equipment will, under a given load, attain its maximum temperature in two hours or less, which was not true of the older types, and in order to give an overload guarantee on such apparatus, the capacity must be increased to that extent, thus increasing the initial cost. In the early days it was difficult to determine the power requirements of a particular drive and the overload guarantee was considered a safety factor, resulting in over, rather than under, motoring thus increasing the first cost and reducing the efficiency and power factor.

In a paper mill the load for many machines is variable, requiring the selection of motors for the maximum demand. With 40 deg. rated equipment it was frequently possible to utilize the overload capacity at times of maximum demand whereas it is necessary to select continuous rated motors of higher capacity, as this type of equipment cannot be overloaded, and when this is done the chief advantage of the new rating, that of lower initial cost, is eliminated. On the other hand the power demanded by paper mill equipment under given conditions is well known and continuous rated motors can often be used thus effecting an appreciable saving. In comparing competitive proposals the temperature rise on which capacities are based must be taken into consideration to avoid unfair comparisons and possible trouble at some future date.

Problems of Lighting.

A most casual inspection of the lighting in the average mill will convince anyone that it can be materially improved, and when it is recognized that proper lighting increases efficiency of workmen, reduces accidents, provides more pleasant surroundings and results in a cleaner mill, thus reducing the fire hazard, it should be given the attention it deserves. The operations being continuous, at least half of the product is produced by artificial light and a good lighting system costs but little more than an inferior one, and some system is necessary in any event.

In laying out the lighting system for a mill, various illumination problems are encountered which may be classified under three heads; local, by means of portable lamps; group, where impractical to illuminate a large area to the intensity required for one or a group of machines; general, to secure even lighting over a large floor. For each of these groups the intensity, quality or color, diffusion and distribution of the light, which are determined by process, hanging height, spacing and color of walls must be considered. As a rule portable lamps are objectionable on account of high maintenance and unsatisfactory lighting, and wherever possible overhead units are preferable, and with modern lighting accessories nearly all mill requirements can be taken care of with this type of distribution. As with other electrical equipment for paper mills, lighting units must be of rugged construction, moisture and acid proof in certain locations, and mounted in an accessible position for cleaning and replacements. From an efficiency and maintenance standpoint it is also good practice to use lamps of high, rather than low, capacity wherever possible.

Electrical equipment as far as the paper mill is concerned is past the experimental stage, and in the building of a new mill or where changes or additions to an old mill are contemplated, it can be definitely determined whether the advantages of electrical methods of power distribution are in favor of its adoption. If equipment suitable for the service is selected and properly installed, it can be depended upon to give service as nearly free from interruptions as any known form of power distribution. Reliability must be the primary consideration, and to insure such a selection all parts must be of rugged construction, capable of withstanding extreme conditions; and accessible so that they can be thoroughly cleaned and readily repaired. Efficiency and power factor are of extreme importance and must seriously be considered, but continuous service is the predominating characteristic that must be fulfilled.

FEBRUARY STATISTICS.

The 46 Companies reporting to the News Print Service Bureau produced 164,547 tons and shipped 165,541 tons during February. Shipments exceeded production by 994 tons. Production figures include 1,029 tons of hanging, of which 67 tons were made in Canada.

The average daily production of news print paper by the mills reporting for February amounted to 84 per cent. of the average daily output during the three months of greatest production in 1920 or 1921, with allowances for new machines.

The 30 United States Mills reporting produced 15,696 tons or 8 per cent. less during the first two months of this year than in same months last year while the 16 Canadian Mills produced 24,587 tons or 18 per cent. more than last year. The total production of these 46 companies for the first two months of this year shows an increase of 8,891 tons or 3 per cent. When compared with same period a year ago.

Stocks during February increased 1,105 tons at United States mill points and decreased 2,192 tons at Canadian points. Total stocks at all reporting mills amounted to 32,569 tons or 1,087 tons less on February 28 than on January 31, and were equivalent to 4 days' maximum production.

$40,000 INVESTED IN EDUCATION.

New York, March 28. — That the paper industry of the United States and Canada has paid nearly $40,000 as merely a preparatory step toward the education of the employees in the mills will be the announcement made at the forty-fifth annual convention of the American Paper and Pulp Association to be held in this city April 10 to 14, when a campaign will be inaugurated among the paper manufacturers for the organization of technical classes in paper making in their mills.

The industry has expended $40,000 merely in the preparation and editing of the text book material which will be used in teaching the mill employees. The cost of publishing five volumes of text books and the expense of instruction will be added to the initial expense, but the result will probably be the most elaborate system of education ever formulated by any industry for its employees. The classes are to be formed only of those already in the mills, and trade schools to train boys for the industry are not part of the program.

At the coming convention the first steps will be taken toward an organized campaign of actual education among the mills. Some mills have actually started the courses before the text books are completed, and methods will be recommended for such instruction through extension courses in all of the paper making states.

A report now being compiled of the present status of the educational movement will be presented by George E. Williamson of Mittineague, Mass., president of the Technical Association of the Pulp and Paper Industry, which, in cooperation with the technical men of Canada, has organized this education campaign. A preliminary report has already been prepared by J. C. Wright, Assistant Director of Industrial education of the Federal Board for Vocational Education, which analyzes the individual courses needed by any employee in a paper mill to prepare him for promotion.

United States Mills

			PRODUCTION					SHIPMENTS		MILL STOCKS
			Maximum in Tons		Actual in Tons					
	Days in Month	Companies Reporting	Per Month	Per Day	Per Month	Per Day	Per Cent. of Maximum	Total Tons During Month	Per Cent of Maximum	Tons
1922—January	26	30	119,600	4,600	93,389	3,599	78.0	90,692	75.9	21,929
February	24	30	111,216	4,634	86,253	3,594	77.5	85,065	76.5	23,034
2 Months	50	30	230,816	4,616	179,642	3,593	77.7	175,757	76.0	23,034
1921—2 Months	50	30	222,300	4,446	195,338	3,907	87.8	183,890	82.6	29,249
Canadian Mills										
1922—January	25	16	88,100	3,524	81.418	3,257	92.4	83,555	94.9	11,727
February	24	16	84,576	3,524	78,294	3,260	92.5	80,476	95.1	9,535
2 Months	49	16	172,676	3,524	159,712	3,259	92.5	164,031	95.0	9,535
1921—2 Months	49	16	152,050	3,103	135,125	2,757	88.8	128,935	84.7	17,110
United States and Canadian Mills										
1922—January		46	207,700	8,124	174,807	6,856	84.1	174,247	83.7	33,656
February		46	195,792	8,158	164,547	6,854	84.0	165,541	84.5	32,569
2 Months		46	403,492	8,140	339,354	6,852	84.0	339,788	84.2	32,569
1921—2 Months		46	374,350	7,549	330,463	6,664	88.3	312,825	83.5	46,359

Note: Maximums Represent Average Production Best Three Months of 1920 or 1921, With Allowances For New Machines

Pumps and Their Characteristics *

(Continued from last issue.)

(continue from last issue.)

CHAPTER XII.

Pump Troubles.

It may be safely asserted that more than one half of the operating troubles originate at the suction side of the pump, and this is particularly true with pumps which have a suction lift.

Where pumps can be arranged so that the water or liquid pumped can flow into the pump suction under a gravity head most of these suction troubles will be avoided and it is only necessary to provide suction pipe connections between the supply and the pump of ample size to allow for a moderate rate of flow and avoid high points or air pockets along the pipe line which will accumulate air and retard the flow.

In the majority of pumping operations connected with pulp and paper mills the gravity feed arrangement can be, and usually is, provided for and therefore these plants are usually comparatively free from suction pipe troubles except that in a good many instances the suction pipes provided for handling heavy stock, particularly in blow pit pumping, are much too small in area to permit of a flow sufficiently free, into the suction inlet of the pump. It is recommended that for this class of pumping that the area of the suction opening of the pump and the entire suction or feed line between the pump and the tank or other source of supply should be approximately three times the area of the discharge opening of the pump.

For instance a pump having a discharge opening of 6'' diameter should have a suction or inlet opening and pipe line at least 10'' diameter—and if the pipe is of considerable length it should be 12'' diameter.

Where there is a suction lift to be taken care of it should be kept within minimum limits for the reason that it is less difficult to provide the tight points and connections required for low suction lifts than in cases where a rather high vacuum is required to produce the necessary lift, because in such cases small leakage of air into the suction will expand to considerable volume and greatly reduce the flow of water to the pump and in some cases the flow may be entirely stopped.

It is probably needless to say that in every case where a suction lift exists it is necessary to have all joints above the water level up to the pump made as tight as possible against air leakage in the pipes and that any horizontal run of piping should be laid level or preferably with an incline towards the pump and without high spots or air pockets to collect air and retard or cut off the flow to the pump; this is most important and although it seems to be quite generally understood as being essential to successful operation yet there are a good many instances where these instructions are not carried out and the result must invariably be trouble.

Another rather important detail in connection with the construction of a suction pipe is the matter of submergence of the lower end of the pipe in the water supply; this should be carried well down below the low water level to prevent the formation of eddy currents around the pipe, due to the disturbance of the surface of the water since these fill with air which may be drawn down into the suction pipe if the end of it is not sufficiently below the surface of the water.

In the cases where foot valves are used at the lower end of the suction pipe or where check valves are installed in the suction line, care should be taken to select valves of such design as will permit an opening equal to at least the area of the suction pipe when the valve port is open; many valves are designed so that they do not have a port opening equivalent to the pipe area and this is very important in connection with centrifugal pump installations where the valve must remain open to permit a steady flow to the pump.

By far the greatest amount of trouble and replacement in connection with direct acting and other types of valve pumps is with the water valves—in spite of the fact that an extraordinary amount of intelligent engineering skill combined with practical ability has been brought to bear upon the subject of the best designs and materials to be utilized for obtaining the most satisfactory results.

The operating engineer who has pumps of these types under his charge and who has his water valves well in hand has reduced his mechanical troubles to a minimum and it should be the essential business of every pump operator to obtain as complete an understanding as possible of the water valve constructions of his pumps and the best type of valves to suit his service conditions both in the matter of smooth, quiet operation and freedom from leakage operation as well as durability.

Spare Parts.

After the engineer has determined the best kind of water valves to use in his pump he should see that a few spare valves are kept on hand, not only the valves themselves but a few stems or valve bolts, springs if used, and valve seats as well. Usually it is not necessary to carry a full set of valve parts in stock as spares unless the plant where the pump is installed, is located where prompt delivery from the pump factory is not possible for the reason that pump valves usually do not need renewal in complete sets but one or two at a time and if valves are made of rubber composition they will deteriorate if left exposed to the air and sometimes they will dry out and crack so that they become practically useless. It is therefore considered good judgement to carry a stock of about one half the number of valves and valve parts required to fit out the pump and to order new ones immediately after any of these are used.

No matter what precautions are taken to provide for carrying spare parts in stock there may be times when these are not available and in such cases temporary repairs can be made which will enable the pump to be kept in service until new parts can be provided.

When a pump is out of commission on account of the breaking of one or more of the water valve discs these may be replaced for the time by temporary discs made of metal plates in the case of pumps having water valves of the standard flat disc valve type, and if suitable material for making temporary valves is not available the valve seat opening may be blanked off with a disc of steel plate or wood.

This blanking off can only done in the case of pumps

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* This material was prepared for the Textbook committee and published with the idea of getting corrections and suggestions. One letter has been received. Others will be welcomed by the Editor.

having two or more valves at each corner, as of course it is not possible to blank off an entire valve area and operate the pump.

There may be times when an entire valve service including the valve seat will get loose and be thrown ou through the discharge pipe and not recovered; in such cases the entire valve seat opening may be blanked off as shown by Fig. 52 until a new valve seat can be fitted to the pump.

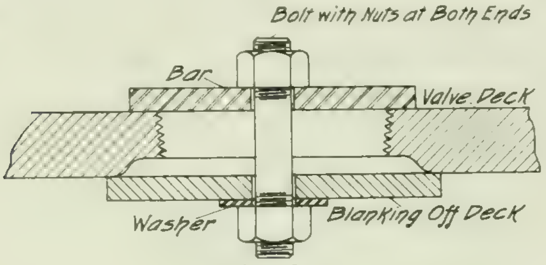


Fig. 52.

When valve seats, which are screwed in place in the valve disc become loose due to corrosion of the threads or stripping it is necessary to re-tap the thread in the valve disc with an oversize tap and secure new valve seats which are threaded larger than standard and which will fit snugly into the threads made in the valve dies by the over-sized tap.

When valve seats which are pressed into the valve deck in a bored taper become loose the valve seat opening in the deck should be reamed out and new valve seats which are threaded larger than standard and than standard so as to insure a tight press fit with the reamed out opening in the valve disk.

In fitting new valve seats the important thing is to have them secured as tight as it is possible to make them in order to prevent them from working loose.

The next most important detail is to have them square and true so that the seating surface is free and horizontal and the valve bolts or stems vertical so as to permit the valve to open and close freely and to seat true and tight.

Starting the Pump.

In starting a reciprocating pump under pressure it may fail because of full water pressure resting on the discharge valves. The air remaining in the pump cylinder is compressed and prevents water from entering the cylinder. It is therefore advisable to have a by-pass between the suction and discharge chambers with an intermediate globe or gate valve to prime the pump.

In starting a new pump, if it does not operate smoothly, usually the first impression is that the steam valves are not properly set. These valves should be the last thing to be disturbed; there is only one proper position for the steam valves on Duplex pumps and this position is given them at the testing room of the pump factory before the pump is tested and any changes made by the operator will nearly always prove to be wrong.

Make sure that the suction and discharge connections, water valves and everything connected with the water end is all right. If on starting a new pump or one which has been recently packed it is found that one or perhaps both of the pistons do not make a full stroke the cause can usually be located at the stuffing boxes. They are probably packed too tight.

In properly packed stuffing boxes it is only necessary to draw lightly on the glands in order to prevent leakage, thereby not only saving friction, but having a much smoother working pump.

When the water pistons are packed with fibrous packing, the trouble sometimes arises from the swelling of the packing, causing the pump to operate with stiff, jerky and uneven strokes. This is especially so when pumping hot liquids and sometimes it is necessary to take out the packing and thin it down.

This is done by stripping a layer from one side of the strand or ring as the swelling is usually lateral. In providing a piston with new packing it is well to soak the packing in warm water over night before fitting it in. New packing should fit the packing space loosely.

Instruction for Setting Steam Valves.

Whenever it should become necessary to reset the steam valves, Fig. 53 should be used for reference until the operator becomes proficient and then follow the directions.

Take off both valve chest covers. Move piston rod R on Right Hand cylinder until piston P strikes cylinder head. Adjust nuts B, so that steam inlet port D is wide open. Then move piston rod in opposite direction until it strikes the cradle head H, and adjust nuts A so that port C, is wide open.

In the same way adjust the valves of the left hand cylinder. These instructions assume that long lever is on the left hand side of pump (standing at steam end) Pumps having only one nut in the center of the slide valve are adjusted in the same manner. If it is found after adjusting the valve for port C and moving the piston rod in opposite direction that the valve overtravels port D, it should be so adjusted that the travel is the same for both sides.

Troubles with Centrifugal Pumps.

With regard to the troubles encountered with Centrifugal pumps the majority perhaps are due to improper priming or the removal of air which interferes with the operation of the pump. Even in cases where there is a possibility of trouble due to air pocketing in the pump casing or in the suction pipe or fittings, if there should be a point which is higher than the inlet opening, precautions should always be taken to remove the air before starting the pump.

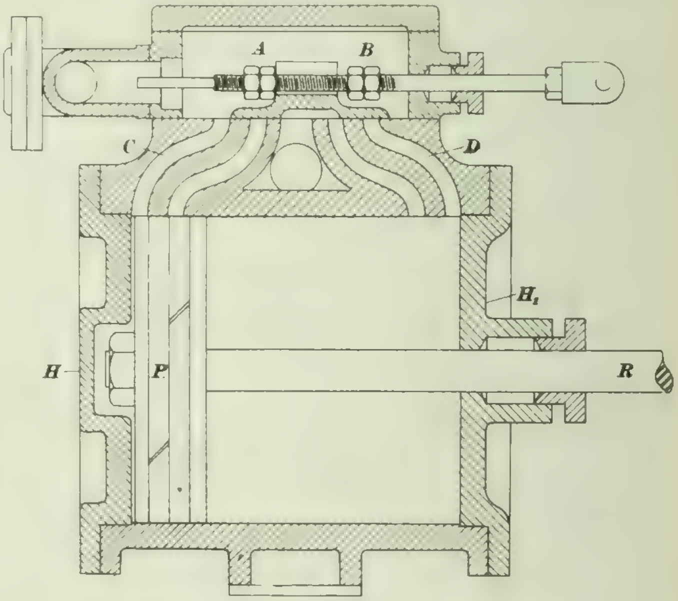


Fig. 53.

If there is a head on the suction the air cock on top of the pump casing should be opened up until a full stream of water flows through it when it should be closed and the pump started at once.

In case of a suction lift the pump should be primed **before starting the pump in motion** according to one of the methods described in a previous chapter. It is important that the pump should be properly primed before starting for the reason that when the impeller is in motion and the pump casing contains both air and water they become mixed up together and it is difficult to seperate the air and work it out of the pump casing.

Bearing troubles are quite often met with in centrifugal pumps though not nearly to the same extent since the almost general adoption of the ring-oiled type of bearing and better class of design and shop work than was formerly alloted to these machines.

Over heated bearings are usually the result of:—

(1) Disalignment of the bearings due to method of installation; The pump should always have the bearing carefully gone over with a level before bolting down to foundation. The bearing should be carefully cleaned out and flushed with kerosene to remove any particles of grit or foreign matter and precautions taken to see that the alignment is not disturbed by bolting down the pump so as to spring the sub-base.

(2) Lack of proper lubrication; this may be due to insufficient oil or impaired quality.

With ring-oiled bearings care should be taken that the oil reservoirs are kept filled to the proper level to permit the oil ring to dip well into the oil and with bearings of the old type the cup feeds should be set by experimenting, to feed a supply of oil which avoids heating without being wasteful. With ring-oiled bearings when the oil is constantly circulated the lubricating qualities are gradually dissipated from the oil which for this reason should be renewed at regular intervals which are best determined by the operator watching the bearings to note the length of time a filling of oil will give good service.

With pumps operating at constant speed and with regular running period and oil of one grade it will be found that the proper periods for refilling the oil reservoirs will be quite regular.

(3) Disalignment at coupling of direct connected units, due to the pump and driving unit not being properly lined with relation to each other. Flexible couplings should always be used when possible, they permit of the slight end play and independent rotative and lateral balance of the pump and its driving unit but they are not intended to over-come the troubles due to disalignment of the unit and they will not do so in a satisfactory manner.

The only remedy for this trouble is to loosen up either the pump or the driving unit from the sub-base and re-align carefully with the other member of the unit. Where the two valves of the coupling are of the same diameter with flanges machined straight across these may be used for lining up and leveling.

(4) Side thrust due to belt strains. These may be caused by the position of the driver and driven pulleys as in cases where the belt is in a nearly vertical position, this requires an abnormal belt tension in order to secure sufficient tractive effort in the pulleys for driving purposes.

Such belt drives will never operate satisfactory, and all belt drives should be arranged as nearly in a horizontal position as the circumstances will permit.

Another cause of this difficulty is the use of pulleys and belts which are not of sufficient contact area to carry the load without excessive tension, this can only be overcome by providing pulleys of ample size and belts of generous width to insure their being well within safe limits for the maximum power to be transmitted. Freedom from bearing trouble as well as reducing belt slippage and frequent taking up due to stretching and lacing troubles are the result of providing pulleys and belts of ample size and easy leads between the pulleys.

(5) Overspeeding the pump beyond the safe limit for which it was designed. This practice will sometimes result in operating a pump at or near the critical speed, at which point it is dangerous to run for any length of time.

Whenever a material speed increase for a pump is contemplated it is advised that the proposed operating conditions be referred to the manufacturer of the pump with request for advice regarding the matter.

THE END.

RIORDON'S DEBTS BEING REDUCED.

The creditors of the Riordon Company have received a letter from the Chairman of the Creditors' Committee, R. Montagu Davy, which says, in part: "Your committee is glad to report that the Kipawa Mill has been operating continuously (though not at all time at full capacity) since October 20, at which time the operation was resumed. The operation of the Hawkesbury Mill was initiated on December 21st, 1921, and continued, until January 22, 1922,at which time for lack of orders, it was suspended. The demand for pulp has shown such improvement as to call for the reopening of this mill and production of pulp will start March 27.

Since reopening to date the Kipawa plant has shipped 16,600 tons and the Hawkesbury mill 4,635 tons. Principally as a result of the operations of the two mills, the company's bank loans (these, of course, were secured) have been reduced by more than three-quarters of a million dollars since the extension, the reductions being as follows:

"Indebtedness—November 17, 1921, to Imperial Bank, $2,704,836,29; March 23rd, 1922, $2,442,103,47; reduction, $262,732.82.

"Indebtedness—November 17, 1921, to Bankof Montreal, $1,708,503,88; March 23, 1922, $1,167,959.18; reduction, $540,544.70.

"A total reduction of $803,277.52.

A Favorable Feature.

"Also, all accrued back wages have been discharged. This reduction of the company's indebtedness, your committee feels, ought to count in its favor, as it now faces the problem of arranging to finance during this year.

"Your committee has arranged with the Board of Directors of the Riordon Co. that all creditors' claims will bear interest from November, 1921. The rate is six per cent.

Supplies on Hand.

"A careful survey discloses the fact that there is a considerable quantity of supplies of various natures, which must be disposed of, and on the suggestion of your committee it has been arranged that lists shall be sent to the creditors of the company who furnished the various lines of materials before offering these to the public, giving them an opportunity to purchase such materials at a price which will yield a profit, and at the same time avoiding any disturbance in the market of the various lines affected."

He who has conferred a kindness should be silent; he who has received one should speak of it.—Seneca.

THE MANUFACTURE OF SPECIAL PAPERS AND BOARDS.

Volume 5 of theText Book being prepared by the Pulp and Paper Industry, includes a section entitled the Manufacture of Special Papers and Boards. Previous sections in the volumes devoted to the discussion of manufacturing operations, will have explained the manufacture and testing of each kind of wood pulp and the following paper mill operations.

The Preparation of Rag and Other Fibres; Treatment of Waste Papers; Beating and Refining; Loading and Engine Sizing; Coloring; Paper Machines and their Operation; Tub Sizing and Finishing Operations. It will be seen that these sections describe the equipment and the processes for conducting the fundamental paper making operations. For the manufacture of the different products of the paper mill, it is number is so large that it would be impossible in the necessary to vary a number of factors. There are a great many different varieties of paper and this scope of our text book, to cover them all intimately. We think it possible however, by tabulating the information, to give the fundamental factors relating to the manufacture of each of the more important ones. The amount of this information that can be given in the text book will depend on the ability and inclination of paper manufacturers to furnish it. It is recognized at the outset as being quite impossible to give all the details of manufacture but the editor hopes through the cooperation of the industry to bring the more important factors to the fore.

The student will have obtained from the study of the sections mentioned, an understanding of the ordinary or average procedure and will understand the meaning of most of the common paper mill terms such as slow stock, rosin sizing, filler, kraft pulp, etc. The aim of the section under discussion is to present or indicate variations from the average procedure which may be required to produce the desired product.

While the following outline, which is adapted from an excellent classification system worked out by the American Writing Paper Co., can hardly be regarded as complete, it will serve as a subject for discussion, criticism and comment either by correspondence with the editor of the text books or at the annual meeting of the Technical Association of the Pulp and Paper Industry in New York next month. The classes suggested are: 1. Boards, 2. Book printing papers, 3. Bristol boards, 4. Building papers, 5. Cover papers, 6. Newspaper, 7. Tissue papers, 8. Wrapping papers, 9. Writing papers, 10. Industrial papers. Under each of these it is suggested to include the following information. A. Raw material for fibre. B. Loading. C. Sizing. D. Coloring. E. Manner of preparing fibre for the beater i.e. that is whether cooked at the paper mill and if so what chemical, what length of time and what steam pressure and whether bleached. F. Treatment in the Beater i.e. whether beaten short, long, free or slow (give average length of time), whether with stone, steel or bronze tackle, also whether Jordaned. G. Paper Machine. Kind of machine used, ordinary speed, whether much or little suction, whether elevated, level or depressed wire, whether tendency to crush whether water-marked. Mesh of wire, character of jacket and felts, whether suction couch used, whether pressed hard or light in the wet presses, whether dried gradually or with high temperature at wet end of driers. H. Sizing. If tub sized with substance used, whether loft or machine dried. I. Finishing. Machine finished, (number of stacks, number of nips), water finished, machine glazed, super-calendered, cut in rolls or sheets, pasted, sheet calendered, plated. J. Treatment. Pasted moulded, corrugated, coated, saturated, reinforced, vulcanized. K. Treated with .(State chemical or substance applied to the paper.) L. Use. (State common use or uses of each grade,) and any special quantities required. M. How sold. Sheets per ream, size basis for weight, etc.

Please state whether in your opinion these classifications should be sub-divided and if so what subdivisions would you suggest.

Would it be advisable to include in this section a brief discussion of such special process as vulcanizing, saturating, making adhesive, carbon, or sensitized papers? This could be done by the use of foot notes.

The following sub-classes of boards and papers have been suggested and the advice of the industry is desired as to whether some of these should be omitted and whether there are others that should be included.

BOARDS box; card middles; counter; leather; manila; patent coated; press spahn; trunk; illust. or album; water proof sign.

BOOK PRINTING bible; coating stock; book; mimeograph; music; offset; text; photogravure.

BRISTOLS index; mill; rope; playing card.

BUILDING felts; deadening felts; gypsum and plaster bds.; wood pulp; sheathing; asbestos.

COVERS box; manuscript; pamphlet; photomounts; black or red paper; for photo purposes; special coating; facing.

NEWS newsprint; hangings.

TISSUE carbon; copying; stereotype; toilet; towelling; pattern; wrapping; cigarette; textile.

WRAPPING bogus manila cartridge; glassine; kraft; mill wrapping; paraffine; rope; vegetable parchment; wood manila;

WRITING bond; drawing; envelope; fines; ledger; manifold; chart and map; papeterie and wedding; linen; safety;

INDUSTIAL for chem. process; for elec. process; absorbent process; sensitizing; printing process (not printed); calender rolls.

ABITIBI ASSISTS MEN BUY BOOKS.

The Broke Hustler prints the following:

The pulp and paper text books which are being gotten out by the Educational Committee of the Canadian Pulp and Paper Association in affiliation with the American Pulp and Paper Industry, are the last word on pulp and paper manufacture. When complete there will be five volumes. The first one deals with the subject that are necessary for the proper study of pulp and paper making, such as arithmetic, physics and working drawings. The second deals with mechanics, electricity and chemistry. The third volume takes up the question of pulp wood and pulp, mechanical, sulphite, soda, etc. Volumes four and five deal with paper making in all its branches.

The importance of these volumes to every man in the mill, especially those who have qualified themselves for the better positions, is realized by the Abitibi Company. In order to make it possible for everyone to get a copy of these volumes, the Abitibi Power & Paper Co. has arranged that the set will be delivered on the basis of $2 a month. As the volumes are $5 each this extends payment for the set over a year.

NOTE:— The Provincial Paper Mill Co. has made a similar arrangement and offer, as announced in the Pulp & Paper Magazine some time ago.

Presentation of Safety Trophies to Don Valley Paper Co., Ltd.

One of the most interesting events of the year in the pulp and paper industry in Ontario was the presentation to their first winners of the flag and shield presented by the Ontario Pulp and Paper Makers' Safety Association for the best accident record during the year 1921 for competition by the mills in Class B. (employing under 200 persons), and as reported in a previous issue the winner was the Don Valley Paper Mills Ltd. of Toronto. Their record was one accident involving the loss of one day's time.

The employees, executive and visitors met in the Finishing room. Mr. Nelson Gain, General Superintendent was in the chair and with him were J.G. Worts, President, and W. Davies, Vice-President, of the Company, Messrs. Geo. Carruthers, and A. P. Costigane, President and Secretary respectively of the Ontario Pulp and Paper Makers' Safety Association, and T. L. Crossley, Chairman of the Committee on Education of the Technical Section.

Mr. Gain in a few words thanked the personnel for their efforts in accident prevention, which had led to the present happy occasion. He drew attention to fact that their's was the first mill to win one of the flags to decorate the plant. He said the careful worker Mr. Carruthers to make the presentation as President of the Association. Mr. Carruthers said that no honor that could come to the mill he presided over was desired more on his part than to be the winner of this shield and flag. He complimented the Don Valley staff and executive on their achievement and called on Mr. Costigane to deliver the shield and flag. Mr. J. MacKenzie, Mill Superintendent, received them on behalf of the company, saying the employees esteemed it an honor to receive the flag and take in custody the shield. If each employee could keep the vision of these trophies before him there would be very strong chances of their qualifying again, and getting another flag to decorate the plant. He said the careful worker was the efficient worker and was the type employers were seeking. He drew attention to the fact that the shield was mounted on wood taken from the first paper mill in Ontario at Thorncliff about two miles up the Don. In conclusion he thanked Messrs. Carruthers and Costigane for their inspiration and advice and the members of the Safety Association for making the occasion possible by inaugurating the competition.

Mr. A. P. Costigane.

Mr. J. G. Worts made a brief address complimenting the personnel and expressing the executive's appreciation of their winners of the flag for their class.

Then Chairman then called on Mr. Costigane to lay before the meeting the facts and significance of the company's achievement. Mr. Costigane said:

Mr. Chairman and Friends:—

Please do not think Mr. Chairman, that I mean any disrespect to you by the form of address I have used. I would like with your permission to place your name high on my list of friends, for I am deeply conscious of the friendly acts you have performed and the friendly help you have given me during the last five years.

I need hardly say how pleased I am to be present to-day. I have been looking forward all during the year to the event which is now taking place, and to the pleasure of being able to congratulate the winners of one of the shields and flags, on the wonderful record they have established and which will be hard to beat. You will possibly appreciate your efforts more when I give you the figures of accidents in your group during the year 1921.

As you know, the mills competing were divided into two groups, A. & B., A. including all mills employing 200 people and up, and B. all mills employing less then 200 people. The idea behind this was to make the competition as equal as possible. It would not have been fair, for example, to have a mill like the Abitibi or the Spanish River compete with a mill like your own, as the hazards in the large mills are much greater, owing to the great operations, than the hazards in the smaller mills. You are winners in group B. with a score of only one accident involving one day lost time. When I tell you that in your group the total number of non-fatal accidents was 228 and 2 fatal, involving lost time of 4,328½ days, or in other words if the time lost was divided among all the people employed, then during the year 1921 every man or woman employed in group B. would have been off work for 2¾ days each, you will fully realize that your record is a highly creditable one.

This accident prevention work has not got beyond the missionary stage, nevertheless it might be worth while mentioning some of the things that go to make success. I am not much given to quoting Scripture, but if you will pardon me I will quote one text which I think aptly hits the nail on the head as far as accident prevention is concerned, viz: —"Am I my brother's keeper?"

Safety campaigns have been started in many industries, some have met with great success, while others have been failures. An analysis of the failures reveals the fact that a fundamental phychological element was absent, and that absent element was a sense of personal responsibility for the other fellow's safety. Many an effort has been made to create a perfect record, and the record spoiled by the thoughtlessness of some individual in regard to the safety of a brother employee. I have from time to time met men whose ideas of Safety could be summed up by the phrase, "I will watch my step, let the other fellow look after his." In accident prevention work, we find the most successful campaigns are in plants where the unselfish principle of looking out for the other fellow's safety is put in practice.

There are thoughtless acts committed every day which are in the nature of a crime, if not legally so described, then most decidedly moral crimes. Take, for instance, a man who to save himself a little trouble, nails the elevator safety gate in an up position, and then proceeds to take the eleator to some other floor. That man to my mind is committing a crime, and if through his carelessness or laziness some one else is injured, the responsibility rests with the man who left the elevator shaft unguarded. I could give you numerous instances of guards being removed and gears and belts left exposed to trap the unwary, and recite many accidents caused by the carelessness of someone else, all of which would serve to illustrate the truth that no one can shirk the responsibility of being his brother's keeper.

There is another aspect of a competition such as is now going on, and that is the sporting aspect. I have no doubt you have all at one time or another participated in such games as Baseball, Football, Hockey, etc., and when playing matches striven all you could to ensure the success of your own side. Suppose in one of those games one of your players by carelessness or stupidity committed a fault as a result of which the whole team was penalized. What would you think of him? I guess the other players on the team would feel sore, and would not hesitate in pointing out to the culprit the errors of his ways. If such is the attitude towards a transgressor in a game of amusement, why should not the same attitude be adopted in a competition for the best accident record, when the lives and limbs of men and women are at stake? I venture to say if such an attitude were adopted by employees in all pulp and paper mills in Ontario accidents due to carlessness or stupidity would be rare indeed.

U. S. BOOK PAPER MAKERS OPPOSE DUTY ON CASEIN.

Washington, D. C., 27, —One of the big American industries has come out definitely against the tariff plan of the Agricultural bloc of Congress, in the filing of a protest by the paper industry against the placing of a proposed duty of 4 to 5 cents a pound on casein. The fact that to produce three pounds of casein takes 100 pounds of skimmed milk which would make nine pounds of powdered milk available for food is featured in the formal protest which was filed Monday by the American Paper and Pulp Association against the duty.

Casein is absolutely essential to the making of high-grade coated papers, the protest says, and it is impossible for the United States to make sufficient casein to meet the demands which are growing daily. There is available for use by domestic mills between 5 and 8 million pounds of domestic casein a year, while in 1920 there was imported 21,238,822 pounds.

"The book paper group of the paper industry," says the protest, "because of high cost of labor in printing, is in a very serious condition running not much so dull than 50 per cent of normal. With the market so dull in this country that many book paper mills are running a third to half time only and then at a loss, the addition of a tariff on raw materials would put many of the mills out of business, giving German and other European mills a greater advantage even than that they already posses over the American mills."

That dairymen have endeavored to discourage production of casein as an economic waste, compared with the amount of powdered milk that can be produced from the same raw material, is pointed out as an additional reason why no duty should be imposed to increase the prices which rose from 7 and 10 cents a pound in 1914 to 22 and 30 cents during the war.

NEWSPRINT EXPORTS HIGHER; VALUE LESS.

Canada's exports of pulp and paper for February 1922, were valued at $8,049,208 compared with $8,831,480 in January and $8,668,815 in February 1920, thus showing a decline of $782,272 from the previous month and of $619,607 from last year.

News print exports were greater than in January, being 70,729 tons compared with 67,701 tons in the previous month and with 52,835 tons in February 1921.

Total wood pulp exports were less than in January 1922, but considerably above the total for the corresponding month of 1921. In February 1922 pulp exports amounted to 43,519 tons valued at $2,447,488 compared with 62,006 tons valued at $3,454,015 in January and 18,538 tons valued at $1,628,976 in February 1921.

Pulpwood exports showed a total of 98,429 cords compared with 66,094 cords in January and 195,037 cords in February 1921.

Comparative details are shown in the following tables.

February 1922.

Paper—	Tons	Value
Newsprint	70,729	$5,040,244
Book paper	56	9,850
Other paper	......	551,626
		5,601,420
Pulp—		
Sulphate (kraft)	11,437	$ 690,757
Sulphite (bleached	8,715	756,457
Sulphite (unbleached)	10,145	594,625
Mechanical	13,222	405,649
Total	43,519	$2,447,488

February 1921.

Paper—		
Newsprint	52,835	$6,256,050
Book paper	288	89,220
Other paper	......	694,569
		$7,039,839
Pulp—		
Sulphate (kraft)	5,176	$ 471,722
Sulphite (bleached)	3,281	431,750
Sulphite (unbleached)	5,758	481,455
Mechanical	4,323	244,049
Total	18,538	$1,628,976

The principal countries of destination during February were:

Paper—United Kingdom, $199,050; U. S. A., $4,782,942; other countries $619,728.

Wood Pulp—United Kingdom, $66,682; U. S. A., $2,240,820; other countries, $139,986.

For the first eleven months of the fiscal year the value of the exports of pulp and paper has been as follows:

	Paper	Pulp	Total
1922	$62,075,520	$32,710,443	$94,785,963
1921	82,217,694	69,030,174	151,247,868
1920	56,022,212	36,945,893	92,968,105

PROCEEDINGS OF THE TECHNICAL SECTION

Discussion of Papers

(Continued from last issue.)

SAFEGUARDING SHIPMENTS OF PULP TO FOREIGN PORTS.

MR. CARRUTHERS: Gentlemen, the first paper this morning will be one by Mr. Charles R. Hazen, Vice-President of the Milton Hersey Company on "Safeguarding Shipments of Pulp to Foreign Ports."

MR. CHARLES R. HAZEN: Mr. Chairman and Gentlemen, you will note that the paper set down for me on the program was one dealing with wire press mats. That topic was abandoned because it seemed that the subject which has just been given out would be of more general interest.

Mr. Hazen's paper on "Safeguarding Shipments of Pulp to Foreign Ports" was published in the Pulp and Paper Magazine for January 26th, 1922.

To be inserted after paragraph re taking samples:

I am taking the sampler's point of view just here. You gentlemen in front of me, especially those who sit at the manager's desk, appreciate the difficulties that a man who is entrusted with sampling faces when he sends an assistant out to sample bales of pulp. It is much easier to take bales of pulp near the door, it is a great deal simpler to take the first bunch of bales that comes to his hand; it is a lot easier to take fifty bales than to take one hundred and fifty. You are conscientious, but you cannot always be sure that the assistant sent out to sample bales of pulp is going to be equally conscientious when he is on the job alone. (Mr. Hazen then read the remainder of his paper.)

MR. CARRUTHERS: Are there any questions to ask or comments to make on this paper?

MR. CROSSLEY: I would like to ask if this paper refers entirely to hydraulic pressed laps in bales?

MR. HAZEN: Yes.

MR. CROSSLEY: I have had a good deal to do with this class of pulp and it has occurred to me that the wedges system is not applicable to it for the reason that the moisture is not evenly distributed in hydraulic pressed laps and that sometimes it will be necessary to take a coffin shaped sample to get the proper proportion of the wet area. The wedge system was originated in connection with pulp whose higher moisture content was towards the edge and whose lesser moisture content was in the centre in a more or less regulated way. In the reading of Mr. Hazen's paper, the fact was brought out that the dryer part of the bale was the outside. In that case you would have the largest proportion of the wedge in the dryer part of the lap and I believe the method would be liable to cumulative error from that source, so that I am not of opinion that the wedge is the safest method to use for getting the best results with this class of pulp. I do think, however, with the speaker, that the manner of cutting and drying the samples is not so important as the taking of a large enough proportion of the bales from the shipment. I think the writer of the paper is very well advised to put that in because I think it is a matter of the greatest importance. The trouble in connection with taking samples from ships arriving in England is that samples have been taken that have not been sufficiently spread through the shipment. I do not think, however, that any particular method could be devised and set up as a standard. I believe that if you appoint a man who has sufficient judgment and experience in the matter of sampling pulp, he should be left entirely free to decide as to the method to be used for sampling a particular shipment. I am further of the opinion that it would be better to get agreeable results from two entirely different methods than it would be to get two agreeing results from the same method, because any error that was made would simply be incorporated in both. Therefore, I have always been very much opposed to hard and fast methods of sampling. The speaker, citing from another writer referred to methods of cutting samples within one-tenth of an inch. It is absurd, I think, to expect that anybody can know or describe what is one-tenth of an inch on the edge of a wedge cut from a hydraulic pressed lap that has been knocked about in transit. We are going too far altogether in some of these details and leaving out the main point which is the getting of a sufficiently representative sample from the whole shipment. The idea of having numbered bales is very good because it would enable the sampler to select his samples throughout the shipment. I am not agreed that this is going to be so painful or laborious as some imagine, if you use the right method which is the disc method. But I agree that the bit type of disc involved a particularly laborious method and that it is easier to devise types which will require a very much smaller sample from an individual bale. You can secure a representative sample of a large number of bales and yet not have a sample so big that it would choke up your oven. Discs of this kind can be cut to a depth of more than three inches, if necessary, with very little inconvenience.

Another thing I have found is that there is not a great deal of variation in the vertical exchange of moisture between the different parts of the bale. There is a horizontal distribution in time, the edges get dryer, but there is very little change for a long period from one layer to another in the bale. The outside layer may be dryer but when you get past the outside layer to the next three or four layers, there is very little difference in their relationship as compared with the laps when they left the mill unless the material has been stored for a number of months. Then the condition has changed but there is not a very rapid vertical change of moisture. There is horizontal change of moisture to a greater degree but not much vertical change. These are points which I thought should be brought out in connection with the discussion of this paper.

MR. F. J. CAMPBELL: In making the final tests for moisture, why do they not go on the total weight of the shipment instead of taking the individual bale?

MR. HAZEN: It is rather a forbidding job to weigh an entire cargo and it has been customary—it is a custom to which all have agreed—to take a proportional number of bales, depending upon the size of the shipment, weighing those to get the average gross weight of the total number of bales shipped. That is a reasonably safe and fair method that does not involve too great an effort. The principal feature of this paper is not a discussion of the merits of the best system of taking samples as we have had many years of discussion as to the best means of doing this. Some have adhered to one system and some to another. Our own experience has been that the question of the percentage of moisture was not the principal issue; it was the question of the selection of bales—the character of the bale whether it had been abraded or not, and how dry it was.

MR. STEPHENSON: The literature, as Mr. Hazen says, has dealt almost entirely so far with the methods of taking the samples from the individual bale, and I think he has brought out very emphatically the necessity for giving greater attention to the selection of the bale. Mr. Crossley has followed up with the statement that the method of taking the actual sample and cutting the disc or wedge is of less importance than that of getting a representative selection of material from the shipment. With the abrasion of the bale from lifting the material into the hold and with the treatment that the material receives from being thrown around during the ocean voyage, the taking of a bunch of bales from one portion of the cargo may give a result, when applied to the whole shipment, that is entirely misleading.

In regard to Mr. Campbell's remarks about reweighing the entire cargo, it has been found that by taking representative, intact bales properly distributed throughout the cargo, and getting the average weight of the bales, a very close check is obtained upon the original gross weight of the shipment. It need not necessarily be within a few pounds of it but it is near enough to show whether or not a serious error has been made in the original billing. The speaker further shows the necessity, if the shipping mill is going to get what is coming to it, or what is due, of taking great care in following the matter up and seeing that when the referee's test is made, or should be made, the mill is properly represented at both ends of the deal. As he says, you cannot expect the chemist working for the receiving mill to take the same care in getting the proper proportion or selection of bales as was taken at the shipping mill. In the first place, it is not so easy for him to do so. It is a fairly simple matter, as the bales pass to the cars or the ship, to sample every fifth, or tenth bale. In this way you get a representative sample. If the man on the other end simply takes the first five bales that come out of the car he may get an entirely erroneous check.

If such a board or committee as has been suggested could be arranged for to which disputes could be referred it appears to me that it would produce good results and that the proposal is a move in the right direction. It is a pretty big question and the loss in dollars on a single large cargo of pulp would nearly wipe out the whole expense.

MR. CARRUTHERS: Are there any further questions or contributions to the discussion of this subject?

MR. A. G. HINZKE: Before this question is disposed of I want a little more information in regard to it because we are having a lot of trouble in testing. In our mill we run our pulp over Rogers' machines. Our pressing capacity is rather limited. Sometimes the production is greater and sometimes it is less; it varies. With a small production we can hold the stock in the press long enough to press it out hard, while with a greater production we do not press it out quite so hard. From every press load we have taken a sample from the top and from the centre of the bale and we have found considerable variation. Some press loads will be held five, some ten and some fifteen minutes longer than others in the press. The whole of the material is tested as accurately as our facilities and ability will permit. The car load tests will vary and that is where the trouble comes is. There will be wetter bundles and dryer bundles. When that carload arrives at the customer's mill and is tested by the chemist over there, he may not find the same bundles: he is liable to get into the wetter bundles. At other times he is liable to get into the dryer bundles, so there is no certainty that the tests will correspond. Sometimes the test runs two or three per cent higher than the weight that we bill at, while at other times it will be that much less. How you are going to overcome that I do not know. I was wondering whether any of the gentlemen present could give us any advice in regard to that matter.

MR. CARRUTHERS: Mr. Hinzke refers to the production of the Rogers' machine the sheets from which are placed together and pressed on the hydraulic press. It is possible that some person can offer a suggestion in regard to overcoming the variation which takes place in the handling of pulp in this manner.

MR. STEPHENSON: I would like to ask those who have had experience along this line as to whether it is thought that Mr. Hazen's suggestion of numbering or marking the bales could be followed a little bit farther and whether the man at the receiving end could in this way be given the opportunity of testing the same bales as those which were sampled and tested at the mill.

MR. F. W. CLARK: Our experience with large shipments is that it is practically impossible to pick out the bales that have been tested before unless you mark them plainly on the outside with a brightly colored paint. Even in cases like that we have found it very difficult to pick out these bales, due to the fact that in the passage and handling of cargoes bales have been rubbed to a considerable extent and the marking has practically been removed. In connection with the numbering of the bales, I imagine that would solve Mr. Hinzke's difficulty. If he has a shipment of dry or light bales, when they are opened up, the numbers are shown and they can discover the light bales that were shipped and how they came to be in the test at the receiving end. For instance, if he has shipped a certain number of bales that are under weight, or low test, due to high production and limited press capacity, these bales being numbered when tested at the mill, will indicate at the receiving mill end that they were low test bales. When they are opened up at the receiving end the low test bales will be discovered by the number which is theirs.

MR. STEPHENSON: I may say for Mr. Clark's information that Mr. Hinzke is referring to pressed chemical pulp from a Rogers' machine and I rather think you are referring to mechanical pulp.

MR. HINZKE: The laps weigh about 50 pounds each and the press load weighs about 1,000 pounds. In testing, from the first press load we take the top lap, from the second press load, the second lap down, and so on until we get to the bottom. In some cases perhaps we do not go quite so far down. Then it is a matter of time or of mechanical difficulty. Every press load is tested accurately in the mill, but at the receiving end they will not get hold of the same kind of bales or in sampling the cargo they may sample all the wet bales or they may sample more dry bales than we found.

MR. STEPHENSON: Is there any appreciable amount of moisture removed in pressing, or is the pressing more a matter of baling?

MR. HINZKE: No, it is the pressing. The longer you can hold the pulp in the press the dryer you can get it. We are pressing as dry as sixty per cent in some cases, while in others it would not be more than fifty per cent. All these wet and dry laps are contained in the same car-loads and how they are going to know this at the other end and test in the same way that we do, is something that I cannot understand.

MR. MASON: As a suggestion, would it not be wise to leave the pulp in the press for the same length of time in each case and then rely on a sufficient number of bales being sampled to get an accurate test?

MR. HINZKE: That is right, if you have sufficient pressing capacity. You could find out then the proper length of time to hold the pulp in the press, but if your pressing capacity is limited, it is not always possible to fix a time for pressing the pulp. We have three presses and we are installing a fourth press for the purpose of overcoming this difficulty. As to the numbering of the bales, I do not believe that would work out because, with a carload of pulp weighing 80,000 pounds composed of 50-pound bundles, it would require an immense amount of time just to number and check all the bales and to pick out the bales at the other end bearing numbers to correspond with the numbers upon the bales tested at the producing mill. When a car is loaded, it is not loaded from one end only. They are loading from both ends at the same time and the bales and numbers are all mixed up in the cars.

MR. HAZEN: I would like to say a word in regard to that. It is not essential that they should get for test the same number of bales as were tested at the mill. The essential thing is that they shall obtain at the other end a proportionate number of bales from each variety of pulp shipped. It is a matter of experience. We put a man at a mill on the Canadian side, we put a man at the receiving end and the two are able to check with in a pound of their average weight of bales. It is purely a question of the selection of the bales for test, and, to be fair in selecting, of taking normal weight bales. If this principle is followed the rest is easy. The big difficulty in this matter is the selection of bales and not in the moisture content of the bales or the method of sampling. The method of sampling will take care of it all right.

MR. HINZKE: We have had proof of the contention of this gentleman in sampling bales. We wanted to see if we are absolutely correct at our mill and in order to do so we would take one bale and cut samples from it, first cutting them from the surface and then splitting the bale in half and taking samples from the middle. As Mr. Hazen will know from experimenting, such samples taken from the surface are always dryer than samples taken from the centre. We retained the whole 50-pound bale, weighed it, dried it out and made a counter-test of the sample; so that I am convinced that as far as the testing is concerned the method is correct because our experience bears out your statement. When the whole weight of the 50-pound bales was tested, it corresponded almost to the dot with the sample. As I said before it is just a matter of taking a corresponding sample at the shipping and receiving ends.

MR. CARRUTHERS: Mr. Hinzke, you were speaking about your inability to get uniform pressing power on account of the presses being worked over capacity. It would depend on operating the presses to get uniform pressing power because you would simply take on an average so much shorter time to cover the production of your mill. I think you could arrange to have your pulp pressed in uniform time although you may be obliged, on account of your lack of capacity, to take a pressing time for each bale about equal to the average time available in periods of maximum production.

MR. CROSSLEY: I would like to say a few words on this point because I think it is quite interesting and I do not think that the members have an idea of exactly what is going on at this mill. I think this mill is the only one that is making this particular form of product at the present time in Canada, is it not?

MR. HINZKE: Yes, as far as I can find out.

MR. CROSSLEY: The pulp goes over the Rogers wet machine and is formed into sheets 30 x 36 inches. They are placed in the hydraulic press in stacks about four feet high; they are a good deal higher than that when they are first placed in there. The individual layers are about three inches thick between the mats of cocoanut fiber used to prevent the stacks from slipping in the press and to help drain the water away. When this stack is received from the wet machine it has a height of about five feet; it is rolled over to the hydraulic press and brought down to a height of about three feet six inches. The man on the machine gauges the spacing between the cocoanut matting as closely and as definitely as he can but sometimes there is quite a variation in the depth between the mats. When the pulp comes out of the hydraulic press some of these laps are two, or two and a half, inches thick and others are perhaps only an inch and a half thick. The peculiar thing is that the sheets in each individual lap that are nearest to the cocoanut matting will run perhaps ten per cent dryer than those at the centre of the lap. The dryer laps being at the outside, the greatest content in moisture is approximately at the centre of the lap. If you have a thin lap you have a good deal dryer lap than if you have a thick lap. If the mill is running slowly you are likely to have more thin laps and these laps will be a good deal dryer. The difficulty that is experienced in connection with testing at the mill is that the edge of the lap is very wet, because that is the way the water runs down in the stacks in the press, but as the stack comes out of the press, when you get about an inch in, you find that the horizontal distribution of moisture is almost the same over the whole sheet with the exception of an inch or an inch and a half at the outside, and in ten or fifteen minutes that moisture begins to seep back again horizontally, but the vertical distribution remains practically constant even for two or three weeks after it is received at the receiving mill; so that it is quite apparent that the form of sampling at the two places will have to be different. A wedge sample cut from that hydraulic lap will have a very wet base but the great bulk of its area will be in material of an almost uniformly dry condition. In order to get a proper sample you would have to take a complete section of the lap that would have a proper proportion of wet and dry material. I have tested the laps in different ways and at the pulp mill the strip method seems to give the best result so long as you pick strips in such a position as to give a proper proportion of strips in the wet edge. At the paper mill there are different methods that give practically the same results. The strip method is used at the pulp mill, or is recommended to be used. The strip should be taken from each truck load as it comes out of the press. You should take a second strip, a third strip and so on until you have made a series that will cover right across the lap. If you do not do that you are liable to meet with difficulties. I do not want to go into this matter in too much detail because the point has not been quite settled yet, but the interesting part of it is the fact that the outside sheets are so much dryer where they are next to the cocoanut mat, that the thinner laps will be dryer throughout than the heavier laps and that there may be thinner laps and heavier laps in the same stack from the same press. It constitutes quite a difficult problem in moisture testing in view of the fact that the moisture is distributed in a different manner after it is received at the paper mill than it is at the moment it is taken out of the press. This pulp has to be shipped immediately so that the test must be taken as it comes out of the press, and, as Mr. Hinzke says, it presents a very interesting proposition in moisture testing. A number of experiments have been made. I thought I would bring up the point so that it will be realised that we are not dealing with bales but that we are dealing with individual laps and that almost each lap has some individual characteristic. The laps which are in the centre differ in their moisture content from the laps near the top, and the laps which are at the bottom of the stack differ again. The sheets that are at the bottom of the individual lap differ from the sheets that are at the top of the individual lap. An adequate moisture testing system would have to take into account a great number of variables and would have to be based on a proper representation of the material under test.

MR. CARRUTHERS: Now, Gentlemen, you see where this discussion lands us. We have opened up and entirely new lot of problems which will no doubt be satisfactorily adjusted after the problems have been studied to a greater extent. We are somewhat limited for time. I am going to ask if anyone has any further remarks to make, and then we will pass on to the next subject.

MR. CLARK: I was wondering if any action was or would be taken by the Technical Section in reference to the last suggestion in Mr. Hazen's paper about a copy for testing. I think that is a very important problem, especially for the manufacturers of pulp.

MR. CARRUTHERS: I would suggest that the matter be referred to the Moisture Testing Committee. We have a committee for that purpose and doubtless, having had their attention brought to it, they will be very pleased to deal with it.

(To be continued.)

PAPER SECRETARIES TOO BUSY TO ATTEND HOOVER CONFERENCE.

The paper industry will not be represented in the trade association conference with Secretary Hoover, scheduled for April 12, because that is the week of the annual series of paper conventions to be held in New York City. Nearly every association in the paper industry will hold its annual meeting in New York City that week, and several on the day set for the Washington conference.

Dr. Hugh P. Baker, Secretary of the American Paper and Pulp Association, the federation of association of manufacturers, has wired Secretary Hoover telling him that while the paper industry is anxious to participate in the proposed conference, the fact that it comes during "Paper week" will make it impossible for any of the secretaries to attend.

It is feared there is little chance of securing a postponement, although some of the best known trade secretaries in the American Association of Trade Secretaries are with the paper industry.

ST. CROIX NOW PREMIER POWER & PULP CO.

The St. Croix Pulp and Paper Company of Hartville, N.S., is reported to have been reorganized and will in the future be known as the Premier-Power and Pulp Company, with a capitalization of $2,000,000. About $1,000,000 will be invested in renovating the old plant, and with proposd improvements, it is expected that the output will be about 8,000 tons of newsprint and 5,000 tons of wrapping paper a year. Any surplus pulp will be sold in the markets of the United States and Great Britain.

PAPER MAN HEADS TORONTO ROTARY.

Mr. Fred L. Ratcliff, president of the Ratcliff Paper Company was elected president of the Toronto Rotary Club at a meeting held 24th March.

Mr. Ratcliff is one of those executives whose idea of keeping fit is to maintain an interest in other things than money making.

He has now the Rotary Club, a golf club and a church building fund on his hands, in addition to numerous other activities wherein the satisfaction of service to his fellow men is the only form of remuneration. None of these prevent him from presiding effectively over the affairs of a successful paper jobbing business.

MR. FRED L. RATCLIFF.

His connection with the paper industry began in the office of Taylor Brothers in January 1886.

CATALOGS WANTED BY COMMISSIONER.

We are asked to announce that Mr. Eugene St. Jean, Industrial Commissioner of the City of Hull, Que. desires to receive, as soon as possible, catalogs relating to this Pulp and Paper Industry.

ALL ABOARD!

Ottawa, March 24.—Provision is made in the estimates tabled today for an exhibition train of Canadian products to tour France on the same basis as the French exhibition train toured Canada last fall. Under the heading of trade and commerce estimates, a ote of $50,000 is provided for this purpose.

After the visit of a manufacturer of paper machines to Camas, Wash., "Making Paper" says, "The Moslem faces the east and prays, but the eastern manufacturers face the west and hope."

NO TRUTH IN REPORTS OF RIORDON CONTRACT.

Reports published to the effect that Sir Frederick Becker, representing an English syndicate, is negotiating for purchase of a large per centage of the pulp output of the Riordon Co., Limited, Kipawa mill, were declared by officials of the Riordon Company to have been unfounded.

In denying the truth of this rumor, Mr I. W. Killam pointed out that a very vital reason why the Kipawa mill would not be likely to enter the overseas export business lies in its geographical position in relation to the seaboard. Mr. Killam further stated that under normal conditions the established clientele of the Riordon Company would require the entire pulp output of the mill in qustion for the manufacture of high-class papers and artificial silk.

Mr. Killam stated that the Kipawa plant had been running from half to full capacity all this year, and that at the present it is running at capacity.

"There is nothing to it," said Sir Frederick Becker, head of Becker and Company, London, when spoken to in reference to rumors from Montreal that he was negotiating a contract with the Riordon Company, by which the British Ludgate Syndicate which he represents would take a big share of the Riordon output.

ADVERTISING INCREASES IN NEW YORK CITY.

Improved business conditions are suggested by a study of the monthly tabulations made by the New York "Evening Post" of the volume of advertising carried in 17 daily and 9 Sunday newspapers of the City, says Mr. R. S. Kellogg, Secretary of the News Print Service Bureau. Comparing the total volume of newspaper advertising in the first two months of 1922 with the total for January and February 1921 we find a gain of 6 p.c. in lineage. The most notable feature is that while local advertising shows a small gain in 1922 over the large volume carried during the same period of 1921, foreign advertising shows an increase of 24 p.c. which is some indication of the extent to which the manufacturers of nationally advertised commodities are vigorously fighting to bring the volume of their sales back to normal after the period of depression. Foreign advertising amounted to 18 p.c. of the total volume of New York City newspaper advertising during the first two months of 1922 and to 15 p.c. of the total volume during the first two months of 1921. During January and February 1922 foreign advertising was 20 p.c. of the total volume of advertising carried in the morning papers, 17 p.c. of the total in the evening papers and 18 p.c. of the total in Sunday papers.

A progressive improvement is indicated by comparisons of the separate months. The total volume of advertising of all kinds in all the issues of the New York City newspapers in January 1922 was 3.5 p.c. more than in January 1921, while in February 1922 the increase was 8.5 p.c. over the volume in February last year. Heavy increases are noted in automobile advertising, while the volume of space devoted to dry goods, furniture and real estate has been especially well sustained.

In the total number of pages printed including both advertising and reading matter, the morning papers show an increase of 18 percent, the evening papers 11 per cent, and the Sunday papers 19 percent, making an average increase of 16 percent in pages for the first two months of 1922 over the first two months of 1921.

FOREMEN'S CLASS GREAT SUCCESS.

Erie, Pa., March 28. — The success of the training conference for foremen held for the foremen of the Hammermill Paper Company, the second of the series of conferences being held under the auspices of the Federal and State Vocational Educational authorities, in cooperation with paper mills, has been such that it has been decided by the foremen who took the work, to continue their conferences for a longer period, without the aid of the federal and state authorities.

This is indication that the first conference series was a thorough success. The federal and state authorities volunteered their aid in the first series, which was for about twenty days of intensive work, but advocated that the work be not dropped then this series was ended, but be continued by the foremen and mill officials themselves.

The action of the mill foremen, therefore, is evidence that the value of the initial series was appreciated by the men who participated in the study. The foremen, moreover, have decided even after the conclusion of the second series, to maintain the study group which has been formed, by holding bi-monthly conferences to continue as may be needed, special study of problems as they develop.

The home conference, as it might be called, which is to take place as the second step in the educational program, will consist of forty hours of work, but will be less intensive, and the hours will be distributed over a longer period than was the case with the initial period.

RUBBER IMPROVES QUALITY OF PAPER

Experiments on the quality of paper in the manufacture of which small amounts of rubber latex are added to the fiber seem to demonstrate that the product is superior to the same material made without rubber. Vice-Consul Wade Blackard of Singapore reports the results of tests in the Feb. 13 issue of **Commerce Reports.**

It is claimed for the process that it will not only reduce the cost of paper manufacturing materially and simplify paper-making methods, but that it will greatly improve the quality of the product.

Experiments were made to show that with an ordinary fiber made into a paper containing one-tenth of 1 per cent of rubber the product had a folding number of 5,000 to 6,000 and a tensile strength two or three times that of the same material made without rubber. But with a rubber content of about seventy-five one-hundredths of 1 per cent the folding number reached 14,500, while the same paper made in the usual manner had a folding number of 30.

Another fiber beaten for half the usual time made into a paper containing 1 per cent of rubber had a folding number of 72,500 and a tensile strength of 87 lb. for a strip 1 in. wide, equal to 6,600 lb. per sq.in., or about twice the strength of a well-vulcanized rubber bursting strength was about 40 lb. for a thickness of compound, such as is used in tires, for example. The one-tenth of a millimeter.

UNION BAG AND ST. MAURICE SHOW LOSS.

Union Bag and Paper Corporation has issued its report for the year ended December 31, 1921, showing net loss of $723,397 after charges and inventory adjustments. This compares with net profit of $3,474,926, equivalent to $23.20 a share earned on the $14,977,850 outstanding capital stock in the previous year.

Canadians are interested owing to the fact that it is the parent company of St. Maurice Paper.

British Trade News

(From our London Correspondent.)

London, March 14, 1922. — The Kellner-Partington Paper Pulp Company, Ltd., which has a share capital of £1,516,105 announced a few days ago an offer of £1,500,000 7½ p.c. guaranteed first mortgage debenture stock at 97 p.c. and inside of a few hours the money was over-subscribed, which should be taken as a good hint by Canadians who want to expand resources. The company was formed in 1889 and in 1917—the registered office is still in London—the shareholders were approached by a group of Norwegians with a view to the sale of their shares. An agreement was come to with Aktieselskapet Borregaard (known as A/S Borregaard) a limited company in Norway, which acquired with some few exceptions the whole of the share capital and debenture stock of Kellner-Partington at a price of £6 per share of each £1 ordinary share, £1 per share for each £1 preference shares and £95 per each £100 of 4 p.c. debenture stock, the total price thus coming to the enormous sum of £6,500,000 in cash.

The Kellner-Partington Paper Pulp Coy., Ltd., possess a paper and pulp mill in Sarpsborg and paper and pulp mills in Austria. In addition at Sarpsborg they own 27,000 h.p. furnished by the waterfalls in Norway.

Capacity of Mills.

The annual capacity of mills in Norway and Austria are stated to be as follows:

	Pulp	Paper
Sarpsborg Mill	92,000	20,000
Austrian Mill	40,000	5,000

These figures are made up by 80,000 tons of high grade bleached sulphite and 12,000 tons of groundwood produced by the Sarpsborg mill, the 20,000 tons of paper being of fine quality; and 40,000 tons of high grade bleached sulphite and 5,000 tons of fine quality paper from the Austrian mill. This is the annual capacity only and they own forests in Norway and Austria of great value.

Now we can look further at the combination, because these mills are competitors of no mean order with the Canadian mills. Kellner-Partington Coy. possessed large interests in Norwegian and Swedish paper and pulp mills — as well as forests — and A/S Borregaard bought up the lot. Their capital is about £3,000,000, no debenture debt, and since formation dividends at the rate of 10 p.c. on shares have been paid. By the deal with Kellner-Partington, A/S Borregaard became owners of some of the largest Scandinavian mills, they also own shares in the Poland Paper Company, in Maine, U. S. A., and output capacity of the mills added to the figures given for Kellner-Partington Coy. is as follows:

	Tons.
Pulp, (all kinds)	200,000
Paper, (fine and kraft)	65,000
Groundwood	32,000

A/S Borregaard own 45 p.c. of the share capital of the Barrow Paper Mill Coy., Barrow-in-Furness, England, so that it will be seen Kellner-Partington and A/S Borregaard, as two companies have great capacity as competitors. Their combined net profits in 1920 reached £625,699 (Kellner-Partington £265,699) and in 1919, £585,151, A/S Borregaard £300,000).

It is now stated that the net proceeds to be received by the Kellner-Partington Company of the issue of £1,500,000 debenture stock, (except about £10,500 required to pay off the existing debenture stock of the Kellner-Partington Coy. not held by A/S Borregaard) will be available for further working capital of the two companies. Large sums of money have been spent and are being spent on improving the mills and the combined assets are put at £6,500,000.

Hjalmar Wessel is the chairman, at present, of the directors of Kellner-Partington and also of A/S Borregaard. The directors are: Cato Rachlew, Jens Frederiksen, Nicolay Maitens, Olar Roen, William Duborgh, Olar Norgaard.

Judging by the quickness in filling the subscription list for £1,500,000 7½ p.c. debenture stock, it shows the great confidence the British public have in pulp and paper investments.

Imperial Paper Mills Loss.

The accounts at August 1, 1921, show a net loss of £97,793, 8s. 6d. by the Imperial Paper Mills, in Kent. It is most serious. The Directors say this week that it was due to the very heavy depreciation in the value of the necessary stocks of pulp and paper-making materials. Contributory causes have been the prolonged and disastrous coal strike and the losses arising from depreciated currencies.

The mills with their magnificent equipment of modern fast-running machinery are being maintained at the highest possible standard of efficiency. The Directors are also confident that, with the large output of the mills, all of which is finding a ready market, the ensuing year will show satisfactory results. The sinking fund is now in operation, and on January 31, 1922, an amount of £54,000 of the 7½ p.c. 15 year first mortgage debenture stock was redeemed.

Olive and Partington, Ltd.

The 1921 report of Olive and Partington, Ltd., a Lancashire firm shows a trading loss of £43,277, but a balance of £7,050 was brought forward and £19,450 received in interest and transfer fees. The 5 p.c. preference dividend took £10,000 and the Directors' remuneration £500. The final result, therefore, is that a debit balance of £27,277 is carried forward. To counteract this the company has a "nest egg" in the shape of £210,765 as a reserve fund and its investments amount to £300,079.

Welcome News.

Provincial Paper Mills Company, Ltd., Toronto and Howard Smith Paper Mills, Ltd., Montreal, are opening a London office under the direction of Mr. N. E. Wainwright. This is what we want to see—Canadians shaking-up the Scandinavians, Americans, and Germans, etc., etc., who hold the present market here.

The Wages and Hours Dispute.

The negotiations between the workers' unions and the Employers Federation are going apace. The two bodies cannot settle everything, so in all probability a full conference will be held this week. One thing is assured and that is there is no imminence of a strike.

Pulp and Paper Trade.

The pulp market shows a little improvement. Groundwood is changing hands at a very slightly reduced price to clear sellers' stocks. Prices, otherwise, unchanged.

Paper industry is still in a state of inactivity—but it is better than it was three months ago. Export trade has given it a fillip. The home demand is fair.

Some have little, some have less; some have not a cent to bless their empty pockets, yet possess true riches in true happiness.—*John Oxenham.*

PULP AND PAPER NEWS

Mr. W. H. Sherriff of the Hodge-Sherriff Paper Company, selling agents in Toronto of Wayagamack Company's products, is on a short visit to their mills at Three Rivers.

Mr. B. C. Nelson of the Kennedy Container-liner and Bag Company of Woodstock of Ontario, was visiting the trade in Toronto Thursday and Friday of last week.

Sir Frederick Becker, chairman of Becker and Company of America, Limited, and Mr. A. M. Irvine, manager spent last week in the Maritime Provinces. They also visited the mill at Chandler, P.Q.

Mr. I. H. Weldon, of the Provincial Paper Mills, Limited, Toronto, and Mr. P. B. Wilson, Spanish River Paper Mills, Limited, Sault Ste. Marie, have been appointed by the Canadian Pulp and Paper Association, as an advising board to consult with the Minister of Lands, Forests and Mines, Province of Ontario, Sir William Price and Mr. Geo. McKee are acting in a similar position for the province of Quebec.

Mr. T. J. Stevenson, Riordon Sales Corporation Montreal, was in Boston last week.

Mr. C. H. Festherstonaugh, manager of J. C. Wilson, Limited, Montreal, visited New York last week.

Mr. S. F. Duncan, treasurer of the Provincial Paper Mills, Limited, paid a short visit to Montreal a few days ago.

Mr. Guy Tombs has been enjoying a holiday at Atlantic City.

Sir Frederick Becker and party have returned to Montreal after an extensive tour of inspection to the pulp mills in which he is interested. The itinerary included Weymouth and Halifax, N. S., and Chandler, Port Alfred, and Chicoutimi, Que.,

Mr. and Mrs. S. J. B. Rolland accompanied by their daughter, Miss Marguerite Rolland and Miss Celine Masson, have returned from a trip to Atlantic City.

LONDON NEWSPAPERS BEGIN PRICE-CUTTING.

Following The Daily Telegraph's reduction of its price to three half-pence, The Times in future will cost everywhere three half-pence to which price it was recently reduced for registered readers only.

NEW PROVINCIAL BOOK MILL AT PORT ARTHUR.

Work is now being commenced on the new $1,000,000 book and writing mill of the Provincial Paper Mills Ltd., at Port Arthur, Ontario. The excavation work has been done so that actual mill construction should progress rapidly.

The book mill will be adjoining the present sulphite mill. It will house one 146'' machine with an output of 30 tons daily. The building will be of concrete and steel and, it is expected, will be completed in about a year.

The engineering and design is in the hands of H. S. Taylor Ltd., Montreal, and the construction will be by the contracting firm of W. K. Trimble, Toronto.

NEWSPRINT CONSUMPTION INCREASED 14 p.c.

According to the Federal Trade Commission the consumption of standard news by metropolitan dailies in the United States using between one-half and three-fourths of a million tons annually for February 1922, when compared with February 1921, shows an increase of 14 per cent and an increase of 6 per cent when compared with February 1920.

The above metropolitan dailies held 64 per cent of the tonnage on hand at the end of the month.

The weighted average price of contract deliveries from domestic mills to publishers during February, 1922, f.o.b. mill in carload lots for standard news in rolls was $3.629 per 100 pounds. This weighted average is based upon February deliveries of about 41,000 tons on contracts involving a total tonnage of approximately 670,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 27,000 tons of standard roll news in carload lots, f.o.b. mill in February, 1922, was $3,479 per 100 pounds. This weighted average is based upon the February deliveries on contracts involving about 297,000 tons of undelivered Canadian paper.

The weighted average market price for February of standard roll news in carload lots f.o.b. mill based upon domestic purchases totaling about 6,000 tons was $3.581 per 100 pounds.

STEEL PLANT BEING MOVED FROM SOO TO FALLS.

The day after the Iroquois Falls team clipped the Greyhounds' claws, Mayor Douglas, of the Soo, wired to Mayor Vanier of the Falls in connection with the bet that the latter had made with him of the paper mill against the steel plant. Mayor Douglas' telegram was very short but very satisfactory. It was "Am shipping the steel plant today."

NEW BURT DIRECTOR.

Toronto, March, 24. — The main business at the annual meeting of the F. N. Burt Company was the decision to increase the directorate from eight to nine members. Miss M. R. Cass, manager of the Buffalo plant of the company was elected to the board. Other members were re-elected.

ELECTRICITY MAKES TROUBLE FOR PRINTER.

A reader of the Pulp and Paper Magazine has informed us that he is having trouble with static electricity in paper which is fed from the roll to a lithographing machine. If any other readers can suggest a remedy for the difficulty, the advice will be very much appreciated.

A car, loaded with kraft at a mill of the Crown Willamette Paper Co. ran away and jumped into the river. It was salvaged.

Technical Section

REVIEW OF RECENT LITERATURE

E-4 Determination of Sulphur Dioxide (and Sulphur Trioxide) in Burner Gases. B. C. Stuer and W. Grob. **Chem. Zeit.**, xlv, 770, (1921); A. Sander, **Ibid**, 771; **J. Soc. Chem. Ind.**, xl, 656A, (Sept. 30, 1921). Stuer and Grob point out that if oxidation of sulphur dioxide during absorption in alkalis is caused by agitation in presence of air, as contended by Sander, it will not be prevented by excluding contact with air, as burner gases contain oxygen. The oxidation can be reduced by addition of certain compounds, but probably not sufficiently to render Sander's method satisfactory. In reply, Sander gives a series of comparative analyses by his method and the Reuch-Lunge method, the former giving a lower sulphur trioxide content in each case. He points out that the high percentage of oxidation (31-38%) found by Stuer and Grob is contrary to every day experience in sulphite manufacture, and repeats that unless the solution is violently agitated the error is inappreciable. - A.P.-C.

K-6. Notes on straw pulps. Raymond Fournier. **Papeterie,** xliii, 921-928, (Oct. 25, 1921). A description of the process of manufacture of high grade straw pulps. - A.P.-C.

K-12. Notes on the Drying of Paper and Cardboard in Sheets. A. Lambrette, Brussels. **Papeterie,** xliii, 722-733, (Aug. 25, 1921). The so-called "counter-current" method of drying paper has two drawbacks: (1) the thermal efficiency is lower than that of any other properly designed system; (2) the average drying temperature must necessarily be relatively low as the maximum temperature is applied to the material when it is practically dry and easily deteriorated by excessive heat. In other systems the highest temperature is applied to the wet material which cannot be injured by it. Moreover, in the case of cardboard, the system possesses the following disadvantages: (1) the edges dry faster than the middle portion of the sheets, and the edge which is turned toward the current of dry air dries faster than the other three, which causes the sheet to cockle; (2) with a propeller blade fan the outside sheets frequently dry faster than the ones in the middle; while with a centrifugal fan the converse is usually true. The so-called "gradual" system of drying overcomes most of the defects of the "counter-current" system. It consists essentially in dividing the dryer into a number of compartments each of which is connected to an independent heater, so that the temperature can be graded as required, and the hottest part is at the wet end, where the paper cannot be damaged by a high temperature. Various modifications of this system are briefly described, and examples are given showing how to calculate the number of compartments, capacity of heaters and of fans, etc. -A.P.-C.

K-12. Jackets. Spanish River News; Pulp and Paper, xix, 1150, (Nov. 10, 1921). Brief outline of the function of jackets and of their method of manufacture. - A.P.-C.

K-12. A New Type of Paper Machine Flow Box. Papeterie, xlii, 72, (Jan. 25, 1920); **Pulp and Paper,** xix, 1164, (Nov. 17, 1921). Translation by A. Papineau-Couture. The apron and slices are completely eliminated, the stock being delivered through a nozzle which slides out of the flow box and is absolutely independent of the wire, the only parts resting on the latter being the deckle straps. The height of the partition in the flow box can be very easily adjusted, thereby adapting the rate of flow of the stock to the speed of the wire, so that it is unneccessary to change the slope of the latter while the machine is running. The thickness of the stock can be adjusted by means of a series of 10 or 20 levers spaced along the whole width of the sheet. By suppressing the slices the formation of air bubbles and foam spots on the wire is prevented, and the output of the machine is improved as regards both quantity and quality. - A.P.-C.

K-12 Controlling the Speed of Paper Machines. M. Argy and L'Homme. **Papeterie,** xliii, 674-678, (Aug. 10, 1921). A brief description of the various types of speed indicators **tachometers** used on paper machines, with special emphasis on the merits of the magnetic (electric) tachometers. - A.P.-C.

K-14 Device for Obtaining a Good Finish on Wove or Laid Paper. Anon. **Papeterie,** xliii, 734, 736, (Aug. 25, 1921). A silk brush about 10 cm. wide is placed under the wire between the first and second suction boxes, directly under the dandy roll. The brush is supported so that its height is adjustable. The hairs should be about 8 cm. long. The function of this brush is to remove the water which the dandy roll has a tendency to retain in the sheet, and thus to prevent crushing of the laid marks at the wet press. - A.P.-C.

K-14. Crowning a Calender Roll. Anon. **The Super-Calender; Pulp and Paper,** xix, 854, (Aug. 18, 1921). A brief discussion of the reason why the top and bottom rolls of a stack of calenders are crowned. - A.P.-C.

K-23. Paper Reinforcing Machine. Can. patents 194,911, 194,912, The Paper Products Co., Boston, Mass., assignee of Charles Henry Howard, Saugus, Mass., U.S.A., Dec. 16, 1919. Claims allowed 17 and 65 respectively. - A.P.-C.

K-20. Vulcanized Fiber and Its Uses. A.R.R. Jones. **Pulp and Paper,** xix, 1121-1122, (Nov. 3, 1921). Brief description of the manufacture of "Diamond Fiber", of its properties, and of the many uses to which the various forms and grades of this product can be put. - A.P.-C.

L-4. Paper Bottle. Can. patent No. 194,602, Jesse H. Perrault, Detroit, Mich., U.S.A., Dec. 9, 1919. A bottle made of one or more plies of paper, the fibers of which are disposed transversely to the bottle, with a neck formed by plaiting the paper and overlapping it in layers with a groove for the cap. Claims allowed 8. Also, Can. patent No. 194,957, Dec. 16, 1919, Claims allowed 2. - A.P.-C.

M-4. Advances in the Practice of Lubrication. Henry M. Wells and James E. Southcombe. **J. Soc. Chem. Ind.,** xxxix, 51-60T, March 15, 1920); **Pulp and Paper,** xix, 1115-1119, (Nov. 3, 1921). The interfacial tension against water of the vegetable and animal oils is much lower than in the case of mineral oil; but if the free fatty acids are removed from the saponifiable oils the interfacial tension rises, and by adding free fatty acids to the mineral oils the tension can be lowered. Similar results were obtained in the case of the interfacial tension of oils against mercury, a liquid metal, which is the closest approach which can be made to measuring the interfacial tension of oil and metallic bearing surfaces. Extensive tests were made on a large friction testing machine and trials on all types of machinery, and it was concluded that (1) the fatty compounded oils are unnecessary for many purposes of lubrication; (2) fatty oils are not essential for such work; (3) fatty acids can entirely and completely displace fatty oils for those purposes. The addition of fatty acids to lubricating oils is covered by Eng. patent No. 130, 677. See **J. Soc. Chem. Ind.**, xxxviii, 674A, (1919). -A.P.-C.

M-0. Concentrators in the Chemical Industry. H. Molinari. **Giorn. Chim. Ind.** i, 267-276, (1919); ii, 60-73, (1920); **Rev. Prod. Chim.**, xxiv, 493-498, (Aug. 31, 1921). A monograph on concentrators of solutions by means of evaporation of water. Description of processes and apparatus are given. The topics treated are: Heating by direct contact, indirect heating with warm gases, concentration by steam heating, concentration under reduced pressure, multiple effect evaporators, vacuum condensers and pumps, and special concentration systems. Diagrams and photographs are given. - A.P.-C.

M-0. The Duplex Plate and Frame Filter Press. Chas. D. Burchenal, New York City. **Chem. Met. Eng.**, xxv, 476-480, (Sept. 7, 1921). A comparison of the advantages and limitations of various types of filtering apparatus and a description of a modified form of plate and frame filter which, in certain features, appears to present a number of important improvements. The Duplex filter press employs double inlets and double outlets. The cloths are supported on a special screen of wide mesh double crimp wire, which in turn is carried on widely spaced reinforced ribs cast on the plate, so that ample space behind the cloth is provided for the fall of filtrate and for the easy access of wash water to the entire surface of the cake. This method of support allows of the formation of cakes of unusual thickness, thus reducing the labor since the filter is dumped at less frequent intervals. A double system of washing is provided so that all cakes may be washed (in alternate directions if desired) by the manipulation of a single valve. Drip cocks have been eliminated, as well as the open drip gutter, yet turbid filtrate from any one cloth can be detected and shut off without stopping the flow from a perfect cloth on the other side of the same plate. - A.P.-C.

M-0. Washing and Washing Ports in Connection with "Chamber" and "Frame" Filter Presses. Eustace A. Alliott, London, England. **J. Ind. Eng. Chem.**, xiii, 976-982, (Nov. 1921). A consideration of some of the factors that affect washing, of the various chemical appliances for effecting it, and of some of the practical and experimental results with various appliances. - A.P.-C.

M-0 Filter Cloth and Its Relation to Filtration. Alvin A. Campbell. Newark Wire Cloth Co., Newark, N.J. **J. Ind. Eng. Chem.**, xiii, 982-984, (Nov.1921). A brief discussion of the advantages of metallic filter cloth.—A.P.-C.

M-0 Industrial Filter Media. Arthur Wright, Filtration Engineers Inc., New York, N. Y. **J. Ind. Eng. Chem.**, xiii, 984-986, (Nov. 1921). A brief discussion of filter media, more particularly cotton and metallic cloths, giving the requirements of a filter cloth and the for which the various kinds are best adapted. -A.P.-C.

M-0. Filter Aids. C.P. Derleth, Celite Products Co., Monadnock Bldg., Chicago, Ill. **J. Ind. Eng. Chem.**, xiii, 989-990, (Nov. 1921). A brief discussion of filter aids, giving their necessary characteristics and advantages, and the condiitons under which it is advisable to use them. - A.P.-C.

M-0. Plate and Frame Filter Presses. E. C. Alford, T. Shriver & Co., Harrison, N. J. **J. Ind. Eng. Chem.**, xiii, 1000-1001. (Nov. 1921). A general description of plate and frame filter presses, of their construction and method of operation. - A.P.-C.

M-0. Modern Leaf Type Filters. Robert C. Campbell, United Filters Corporation, New York, N.Y. **J. Ind. Eng. Chem.**, xiii, 1002-1004, (Nov. 1921). A description of the Kelly and Sweetland Filters and of the American continuous vacuum filter, and of their method of operation, field of usefulness, labor requirements, power consumption, and filter cloth consumption. - A.P.-C.

M-0. Oliver Continuous Filters. H. A. Morrison, Oliver Continuous Filter Co., New York, N. Y. **J. Ind. Eng. Chem.**, xiii, 1005-1006, (Nov. 1921). A description of the principles involved in the Oliver filter, of its uses, advantages and limitations.—A.P.-C.

M-0. Leaf and Rotary Suction Filters. G. D. Dickey, Industrial Filtration Corporation, New York, N.Y. **J. Ind. Eng. Chem.**, xiii, 997-999, (Nov. 1921). A description of the principle of suction filters and of various types of commercial suction filters. - A.P.-C.

M-0. The Atkins-Shriver Automatic Filter Press. H. D. Atkins, T. Shriver & Co., Harrison, N.J. **J. Ind. Eng. Chem.**, xiii, 1006-1007, (Nov. 1921). A description of the filter, its method of operation, application, and advantages. - A.P.-C.

M-0 Valez Rotary Filter. H. A. Valez, Bay City, Mich. **J. Ind. Eng. Chem.**, xiii, 1007, (Nov. 1921). A description of the filter and of its operation. - A.P.-C.

M-4 Automatic Electrolytic CO-Recorder. K. von Haken. **Z. angew Chem.**, xxxiii, 188, (July 27, 1920); **Chimie et Industrie**, vi, 483, (Oct. 1921). The flue gases are first washed and are then sent to an absorption tube containing glass beads and a 0.1% caustic soda solution. The sodium bicarbonate solution formed is decomposed in a small cell, the current for which is supplied by a small induction coil. In the circuit if the induction coil is a milliammeter, which may, if desired, be graduated to read percentages of CO_2 directly. The gases enter and leave the apparatus through two valves which are controlled by floats which rest on a light liquid in two differential manometers, so that the rate of flow of the gases through the apparatus can be maintained constant and adjustable. The rate of flow of the gases also controls the rate of flow of the soda solution which is so chosen that only bicarbonate will be formed, thus ensuring complete absorption of the CO_2. The apparatus may also be used for the determination of SO_2, NO_2, NH_3, etc. It readily shows differences of 0.1%. - A.P.-C.

R-9. Preferential Tariffs Applicable to Imports from Canada. William Gilchrist, Chief Foreign Tariffs Division. **Weekly Bull., Dept. of Trade and Commerce,** Ottawa, Canada; **Pulp and Paper**, xix, 1165-1167, (Nov. 17, 1921). A survey of the advantages which Canada enjoys in the various British markets in consequence of Imperial preference. - A.P.-C.

R-13. American Pulp and Paper Convention, Nov. 3-5. 1921. Roscoe Smith. **Pulp and Paper**, xix, 1143-1145, (Nov. 10, 1921). Brief account of the convention. A. P.-C.

UNITED STATES NOTES

The special committee of New York members of the Salemen's Association of the Paper Inlustry has decided upon the Arkwright Club as the place for future regular meetings. The next meeting will be on Wednesday, March 29, and future meetings will be held regularly the fourth Wednesday of each month.

The Carthage Sulphite Pulp and Paper Company closed a deal last week whereby it comes into control of the mills of the Champion Paper Company of Carthage and the Ogdensburg Paper Mills, Inc., of Ogdensburg. These mills, it is said, and others that are being sought by the Outterson interests, headed by James A. Outterson, are ultimately to be merged, resulting in a consolidation involving values estimated at from $3,000,000 to $5,000,000. The sale of the Champion mills means the retirement of the Hanna Brothers from the field of active paper manufacturing in Northern New York. The acquisition of the Champion Mill by Mr. Outterson is regarded as a shrewd move inasmuch as it affords a means for disposing of surplus sulphite and pulp from the Carthage Company's mills. To the equipment of the latter, which now manufactures board paper, Mr. Outterson intends adding a book paper machine. The Champion mill, now manufacturing catalog paper, is adapted also to the manufacture of book paper, and this will be the main product when Mr. Outterson takes possession. Mr. Outterson's own sulphite mill has a capacity about twice the requirements of his paper mill, and lack of demand has caused his pulp mill at Ogdensburg to run at reduced capacity. By diversion of present surplus to the newly acquired plants, capacity production can be maintained. A pipe line can easily be installed to carry the sulphite to the Champion mill, thus avoiding the usual expensive method of converting it into laps. The bleached wood pulp will be shipped from the Ogdensburg plant, increasing the activities there.

The Union Bag and Paper Corporation reports for 1921 a loss of $723,397 after charges and inventory adjustments in contrast to net profits of $3,474,926, earned on the $14,977,850 of its capital stock outstanding in 1920.

The fire in Chicago recently which razed an entire section of manufacturing buildings, destroyed the plants of five firms identified with the paper industry. They are: The Sterling Paper Company, a jobbing house handing printing and other lines; R. F. Teart, paper rulers; the P. & R. Envelope Company and the Bourke-Rice Envelope Company. This latter firm established temporary quarters at once, and through an advertisement published in a weekly industrial journal of Chicago announced that business was going on as usual. The announcement ran: "Though Our Factory is Still Burning—We Can Deliver the Goods."

In a ruling handed down last week, the Interstate Commerce Commission held to be unreasonable and unduly prejudicial the freight rates on newsprint, wallpaper and certain grades of wrapping and bag paper from places of manufacture in Wisconsin, Minnesota and Michigan to places of consumption in the Mississippi Valley and the West and Southwest, and from points in Indiana, Illinois and Kansas to Wichita and Oklahoma. The commission combined several cases dealing with rates on paper of various grades. It directed that these rates be modified. Permission was given the railroads to maintain present rates until June 1 and meanwhile submit new schedules for approval.

A new two machine mill, having a capacity of 80 tons daily and costing about $1,500,000 will be erected this spring by the Kalamazoo Vegetable Parchment Company. Two 165 inch Fourdriniers are to be installed. One of these will have a speed of 1,000 feet a minute and the other will run 600. Additional hands numbering about 250 will be employed and the plant's capacity is expected to go from 60 to 140 tons daily. The new Fourdriniers are intended for use in the manufacture of special papers.

Complaints that Canadian pulpwood is being dumped on the American market apparently are unfounded. This seems to be indicated in the preliminary investigation of the United States Customs Service.

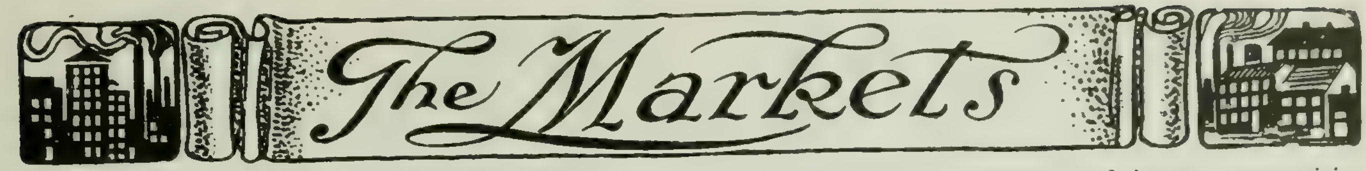
A new line of flat mailing tubes under the trade names "Rex" and "Peerless," are being put out by the International Mailing Tube Company of Brooklyn. The tubes are designed for flat shipping, storage and dressing, but when ready for mailing they may be rolled to any diameter desired.

Harry H. Phillips, Frank B. Black, both of Chicago, and Charles J. Horn of Wilmette, Ill., are named as incorporators of the General Bax Corporation, just organized in the State of Illinois. The new concern's capitalization is put at $12,000,000 and it will engage in the manufacture of paper board boxes.

Improvements requiring an outlay of nearly $500,000 are under way for the Scott Paper Company at Chester, Pa. Remodelling of one of the buildings, installation of new paper making machinery and enlarging of docking facilities along the Delaware River are being counted on to increase the plant's output approximately one-third. A larger sales force and additional mill hands will be engaged to handle the increased production.

An operating loss of $1,201,913 is shown in the 1921 report of the Eastern Manufacturing Company. After adjustments there was a net decrease in profit and loss surplus for the year of $1,563,626. This shows as large a total on the loss side of the ledger for 1921, as was entered for 1920 on the profit side. The operating profit at the close of that year was $1,156,863. Stuart W. Webb, chairman of the board of directors, takes the view that there is a more promising outlook for the present year. This, he says, is evidenced by the better volume of business during recent months. He states that the physical property of the company is in excellent shape, that the organization is more efficient than at any time, that inventories are priced at conservative figures and that the company is in comfortable shape financially.

Constant Southworth, who was formerly associated with the United States Tariff Commission, has become assistant to Grosvenor M. Jones, chief of the paper division of the Department of Commerce. Mr. Southworth will engage in statistical and research work. He was connected on the tariff Commission with the special survey of the paper industry complied for the Ways and Means Committee of the House of Representatives.



CANADIAN TRADE CONDITIONS.

Montreal, March 28.—A more optimistic feeling is apparent in the reports from all parts of Canada on business conditions, according to the Royal Bank of Canada. In the eastern provinces, particularly,is this the case. Here, in spite of the fact that inactivity in some lines still persists, the general outlook is improving and it gives promise of betterment as the spring advances. A fairly large number of manufacturers are experiencing a slight revival in business, the impetus of which is extending, in some measure, to the wholesale and to the retail trade. In the West the movement is not so pronounced, but here, too, there is some ground for encouragement, so that taking it by and large it would seem that a return to somewhat more normal conditions in trade is looked for throughout Canada. But the present period is one of transition.

During the week there were two developments illustrating the greater public interest in the pulp and paper situation. For it was announced that the Wayagamack will soon be in the market for more capital in order to meet obligations incurred sometime ago by the purchase of timber limits and plant extensions. This announcement will not have surprised those who have followed the fortune of the company. Then there was quite a little flurry over the report that Sir Frederick Becker was negotiating for a position of the output of the Kipawa plant of the Riordon Company. The report was denied both by Mr. I. W. Killam and Sir Frederick Becker. The latter by the way is an old customer of the Riordon Company.

Groundwood shows no improvement either no price or volume of sales. There is a slightly better demand for bleached sulphite, with prices on a profit-bearing basis, although generally speaking the market is not what one might call brisk. Considering conditions, the exports of pulp are by no means bad, showing a considerable increase on the first two months of last year; prices however, indicate a substantial decline.

The newsprint situation is satisfactory. The demand is increasing, and according to advices from the across the border, the chances are that it will continue to be of large volume, sufficient to keep the Canadian Mills busy for the remainder of the year.

Regarding bonds, writings and book papers, the reductions now in force are bonds from 1c. to 1½c.; writing ½c., and book ½c. It is understood that there have been extensive importations of American bonds at prices considerably below Canadian mill quotations, in fact the prices of the imported goods are so low as to raise the question as to whether the goods do not come within the Anti-Dumping Act. Canadian mills are meeting this competition by cuts in prices and by making other grades of bonds.

There is practically no change in the other departments. Wrappings are being more freely sold, and there is a good demand for toilets and tissues.

Toronto Topics.

Toronto, March 25th. April weather is reflected in the market situation round here. We called on one of our board mill friends a day or so ago and listened to a dirge about quiescence and import competition. Leaving that house of mourning we got hold of a wrapping man whose idea seemed to be that the market had been frozen into a sort of Lot's wife affair and could be summed up in the phrase statu quo, which being interpreted means nothing. A waxed paper man gave us a little encouragement, saying he was blessed with orders and liked the prospect. This morning we called on a well known jobber, and his voice had a cheerful ring. "Looking up" was his response. "I've just come from a meeting of our travelling staff and they report improved conditions not only in the city but elsewhere. Orders are coming, not so much in increased numbers but in greater volume." He thought the signs were distinctly in favor of a steady improvement.

There is good demand for all grades of writing, and mills making this type of paper are running full time.

Pulp and Paper Prices.

Pulpwood:— Not peeled, on cars, around $5.00. Reports indicate a fairly large cut this winter on settlers' lands.

Groundwood:— News grades $25. to $30. Book grades $35. to $40.

Sulphite:— News grades at mill $60. Book grades at mill $70. Bleached at mill $95. to $100.

Writings:— Reductions are in effect in most lines affecting high grades to the extent of about 5 per cent and lower grades about 10 per cent..

Boards:— Quiet, subject to severe import competition.

Wax paper:— Good business coming in.

Wrappings:— No.1 Kraft 8¾c. per lb. Colored Kraft 9¼c. to 10¼c. per lb. Manilla 5¼c. to 7½c. per lb.

Bags:— Manila 65 per cent off regular list prices. Light Kraft 65 per cent. Heavy Kraft 70 per cent. White Bond 45, 10, 10 per cent.

Tissues and Toilets:—

Manilla	20x30	$ .85	24x36	$1.15 Rm.
Nat. White	20x30	.95	24x36	1.35
No. 1 White	20x30	1.25	24x36	1.75
White Sulphite	20x30	1.10	24x36	1.55

Towels:— Interfolding $5.50 per case. I.X.L. Roll $15.25 per case less 22 per cent.

Markets on most grades of Waste Paper remain nominal. Demand from local Board Mills for lower grades continues firm with no changes in prices. Books and Magazines are moving along in fair volume at quoted prices, and the same applies to Ledgers and Writings. There has been a firm demand for Kraft Papers, but not enough to cause any marked increase in values. Cotton Rags, of all grades, are moving slowly, and several of the larger packers report slightly lower quotations from Roofing mills.

There has been practically no noticeable changes in any of the quotations given during the past two or three weeks. Reports from American mills show a steady consumption of most grades. There has been very little tendency on the part of any of these mills to pay higher prices for this stock, as they seem to be getting sufficient supply for their immediate requirements at present quotations.

Paper Stock:—	
No. 1 Hard White Shavings	$3.75 - $4.00
No. 1 Soft White Shavings	3.15 - 3.35
Heavy Books and Magazines	1.65 - 1.75
Ledgers and Writings	2.00 - 2.10
No. 1 Kraft	2.25 - 2.30
Newspapers	.85 - .90
No. 1 Mixed Papers	.50 - .60
Cotton Rags No. 1 Whites	4.25 - 4.50
Thirds and Blues (repacked)	1.50 - 1.75
Roofing Rags	.95 - 1.00
No. 1 White Shirt Cuttings	8.50 - 9.00
Fancy Shirt Cuttings	3.75 - 4.00
Canton Flannels bleached	6.25 - 6.50
White Lawns	7.50 - 7.75
Blue Overall Cuttings	4.75 - 5.00
Ropes & Bagging —	
No. 1 Scrap Bagging	.50 - .60
No.1 Manilla Rope	3.75 - 4.00
Mixed Strings	.70 - .80

NEW YORK MARKETS.

New York, March 25 — (Special Correspondence)—What appears to be the outstanding development in the market this week is the marked improvement in demand for box boards. Reports emanating from numerous quarters say that there is more activity in the board industry than has been noted in some time; that paper box manufacturers have resumed buying to a very noticeable extent; that mills are obtaining many more orders and are increasing their output, and that present indications point to a continued expansion of the board movement. New York board dealers and distributors assert that they are selling greater amounts of board than in many months, and while it is generally admitted that prices are low and that mills are still competing for business, it is stated that if prevailing market conditions last it is more than probable that prices will be readjusted to levels where board producers will be enabled to operate at a better profit for themselves.

It is learned on high authority that some board mills have booked orders absorbing their entire production for the month of April, and in quite a few cases orders have been placed for May deliveries. Reports say that there has been considerable improvement in demand for paper boxes of various kinds—boxes for the clothing trade, folding boxes, food containers and fibre shipping cases. Obviously the increased demand for boxes is the reason behind the improved call for box board, and the livelier status of the board market is making for a firmer price tone although no actual changes of note have occurred in board quotations. It is stated that the great bulk of orders placed for board have been at about a basis of $37.50 per ton f.o.b. New York on filled news and $35 on plain chip board. Some business has been done at slightly higher prices, but most manufacturers have accepted orders freely at these figures.

Another important development is the report that there is every likelihood of an import duty being imposed on wood pulp under the new permanent tariff bill now being considered by the United States Congress. News of this, which has only just come out, was quite a surprise to the trade as no one surmised that Congress had any intention of placing a duty on pulp. It appears, however, that pressure has been brought to bear on some of the Congressional leaders in Washington, presumably by domestic pulp manufacturers, to have wood pulp put on the dutiable list in the new tariff act, and that these efforts have been successful; that is, successful as far as the matter goes up to the present. It is reported that when the new tariff bill is reported out by the Finance Committee of the Senate, which is now considering the new schedule of duties, it will be found a tax of either 5 or 10 per cent was imposed, but since then it is underical pulp of all kinds. Ground wood is not to be taxed. Whether the duty is to be 5 or 10 per cent is at present problematical. When the Senate Finance Committee first placed pulp on the dutiable list a duty of 10 per cent was imposed, but since then it is understood that this has been reduced to 5 per cent, which will be operative on the American valuation plan.

There is, of course, much opposition to the proposed pulp import duty. Pulp importers are exerting efforts to defeat the inclusion of pulp on the dutiable list, and paper manufacturers and large paper consumers, including newspaper pulishers, also are bringing pressure to bear to have pulp kept on the free list. Newsprint manufacturers argue that it would not be fair to tax their raw material while permitting print paper to come in free, and that this one-sided condition of affairs would serve to stifle the production of newsprint in the United States and tend to drive the industry into Canada. Pulp importers contend that a duty on pulp would tend to create a monopoly for domestic pulp producers and act to the detriment of the domestic paper manufacturing industry. It is understood that those who have urged the imposition of a duty on pulp cited the large importations from Europe and Canada in recent months and the greatly reduced operations of pulp mills in the United States as reasons why pulp should be taken off the free list and a duty of at least 10 per cent ad valorem imposed.

There has been a little pick-up in demand for kraft wrapping paper and prices evince a stiffening tendency though No. 1 domestic kraft continues to be available at around 7 cents per pound. Tissue papers also are wanted in somewhat larger quantities, and prices hold steady, while book papers are moving better than in some time notwithstanding that individual orders from publishers and printers are mostly for small tonnage. Fine papers are characterized by a moderate demand and quotations are well maintained. Nothing new has developed in the newsprint market. There is a consistently good movement of print paper and prices remain steady.

GROUND WOOD. — The mechanical pulp market lacks feature. On the whole, there is a fair business transpiring although it is plainly evident that consumers are ordering supplies in hand-to-mouth fashion, seldom absorbing other than tonnage directly required. Nevertheless sufficient business is going through to give the market a moderately active tone, and quotations, if anything, incline upward. Domestic grinders continue to quote at around $32 a ton f.o.b. pulp mills, with sales reported on a delivered consuming point basis of between $40 and $42 a ton.

CHEMICAL PULP.—Most grades of sulphite are enjoying a fair demand, at least they are moving in relatively better amounts than other kinds of chemical wood pulp. Unbleached sulphite of No. 1 quality and of newsprint quality are selling rather freely, and there is a comparatively good trade reported in foreign sulphite of both bleached and unbleached variety. Domestic bleached sulphite is in slack demand, presumably because the prices quoted are so much higher than those prevailing on imported bleached sulphite.

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INQUIRIES SOLICITED

Kraft pulp is in limited call, yet quotations appear to have steadied and no further decline has been noted. Soda pulp for book paper purposes is moving slowly and tends downward in price, with most consumers reported covering their wants without difficulty at around 4 cents per pound delivered.

RAGS.—The papermaking rag market in New York is devoid of important activity, and reports from various parts of the United States are to the effect that the situation in rags all over is equally as quiet as it is locally. Consumers are buying very cautiously. Moreover, it appears that a great majority of rag paper mills are not operating at anything approaching capacity and therefore do not require as many rags as ordinarily, thus enabling them to keep out of the market as buyers excepting at spasmodic intervals.

Prices on all grades of rags are tending downward. Roofing stock has steadily dropped until felt manufacturers are now buying No. 1 packing at 90 cents a hundred pounds f.o.b. New York, and No. 2 packing down to 80 cents. Old whites are lower, with dealers offering No. 1 repacked at 5 cents a pound at shipping points, and No. 1 miscellaneous packing at 4.50 cents. Old blues are scarcely wanted at any price, and new cuttings are mostly neglected excepting for several grades such as No. 1 white shirt cuttings and unbleached muslins. There has been a little run of demand on white shirt cuttings, and No. 1 packing has sold to paper mills at around 10 cents a pound delivered. Indications are that the least improvement in demand would immediately result in higher prices for rags because market levels have receded to a point where only a slight show of trade activity would cause the trend to turn the other way.

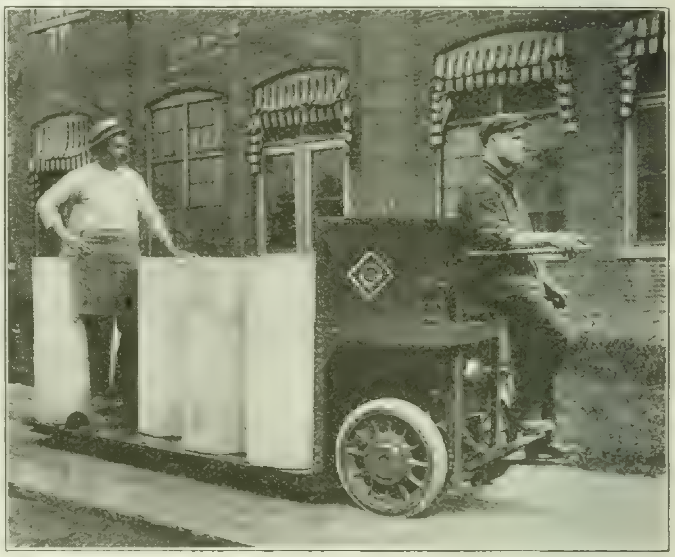
PAPER STOCK.—Old paper is moving in scattered directions and in rather limited amounts. Aggregately, most grades are finding a fair outlet, yet there is no concerted movement of any single grade, and buying by mills is of a character which fails to have sustaining influence on values, with the result prices in most instances are on the down grade. White shavings have sold this week at 3.75 cents a pound f.o.b. New York for No. 1 hard, and 3.10 cents for No. 1 soft shavings. Old books and magazines are bringing only around 1.40 cents New York, old No. 1 kraft paper 1.80 cents, white news cuttings 1.70 cents, and ledger stock 1.65 cents. Folded newspapers are easy and sales to board mills are reported at 57½ cents a hundred pounds New York. No. 1 mixed paper is probably in as good demand as any other grade and is selling at about 45 to 47½ cents a hundred pounds f.o.b. New York.

OLD ROPE AND BAGGING. — A medium demand exists for old bagging and paper mills are reported granting around $1 a hundred pounds at dealers' shipping points for No. 1 scrap bagging, and 75 cents a hundred pounds for roofing bagging. Old rope is marked by no new trading feature and the scattered sales reported to paper mills are at an average of 4.25 cents per pound for domestic manila rope in No. 1 condition.

A NEW DROP FRAME TRUCK.

In handling barrels ,bales, bags or heavy rolls, there has been a demand for an especially low loading platform electric truck.

Elwell-Parker, as heretofore, after a survey of the field, has produced, and has had in operation for some time, a truck built up of 95 p.c. standard parts on special frame. This equipment offers the solution to many annoying trucking problems, where hauls are so long that a man with a hand chisel truck is too slow and expensive a means for the movement of materials.



This truck carries a storage battery on the upper deck with motor and worm drive axle beneath. All four wheels steer. "Kick-up" on platform houses the rear wheels. Drive wheels are fitted with 21 1-2" x 3 1-2" rubber tires and the trailing wheels with 10 1-2" x 5" tires. Will operate 15 to 20 miles on a single battery charge.

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A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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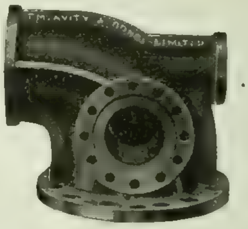

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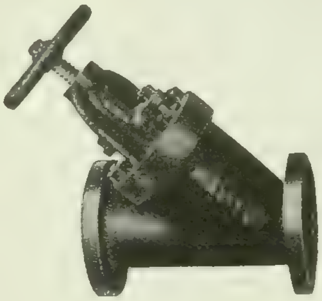

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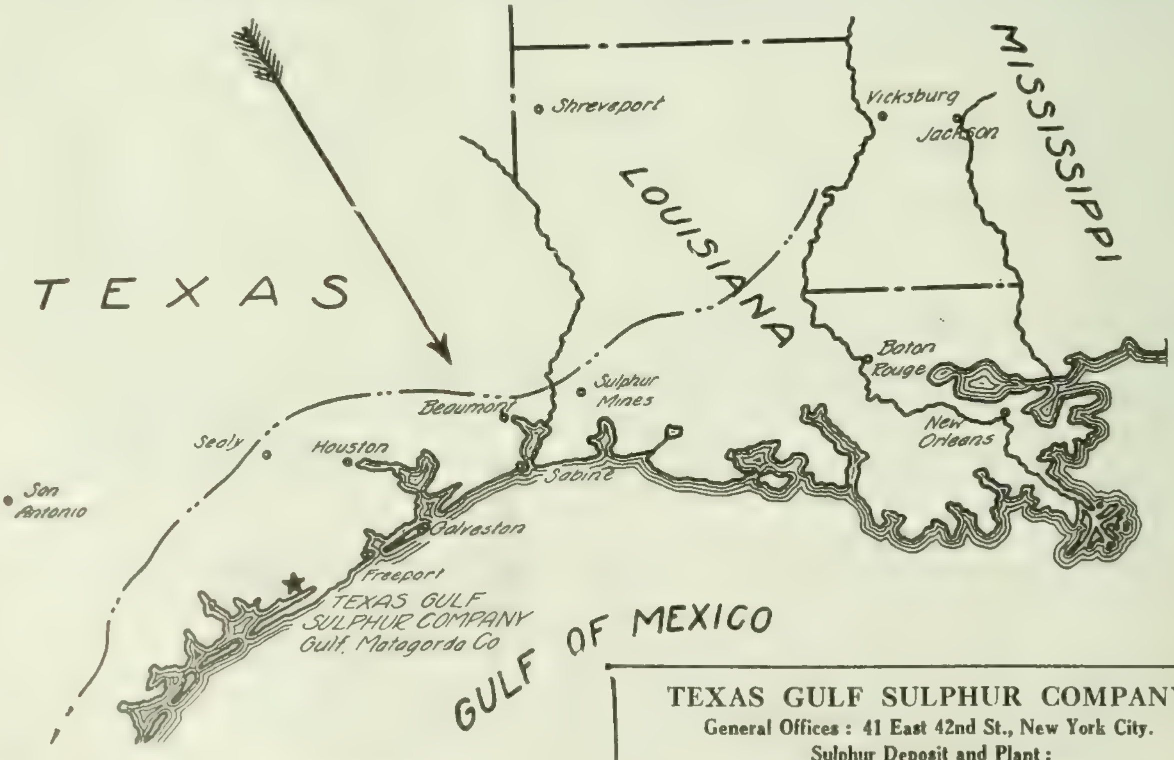

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:-: EDITORIAL :-:

THE DECENTRALIZATION OF INDUSTRY.

The Journal of Commerce is strongly in favor of some kind of bonus as an inducement to the "ruralization of industry". The pulp and paper industry furnishes many instances of large mills successfully planted in country places. Perhaps that is why they are called plants. At any rate, we fully agree with the following paragraphs from our contemporary.

We are living in days when class consciousness is keen and class bitterness acute. In this country, as in others, the artificial barriers which separate the rich from the poor are high enough. But here in Canada, thank God, they are at least not insuperable. It should be the fervent aim of all men of goodwill to prevent their becoming so. There is one most efficacious way in which all such can help to draw the poison-fangs of the brazen-lunged revolutionary. And that way it is up to us all to take. We have in our generation, if we would remain a generation at all, to effect that solidarity of classes—between Capital and Labor, between employer and employed — without which progress is a phantom and hope of prosperity a farce. We need to restore a common pulse, a healthy beat to the heart of this Dominion. It is a great work, the work of individual citizens as much as—nay, more than—of Governments, alien from none of us, but rather, on the other hand, highly pertinent to us all.

Each in his place, and in degree, can further it. Each one of us—employer and employed, capitalist and artisan, manager and mechanic—is privileged to play a part in this sublime work; to restore or create harmony between man and man; to look, not for the incidental, or accidental, differences which separate, say Capital from Labor, or employer from employed, but for the common sympathies and common understandings and common aspirations and common needs which underlie and connect all humanity.

There are few who are doing more, in this our day and generation, to help forward this work—a sublime work as we have ventured to call it—than those manufacturers who, taking their courage in both hands, have located their industries in one of the smaller country towns. Frequently, they have only been enabled so to locate by the grant of exemption from taxation for a period sufficiently long to enable them to educate the local people to do their work, or to provide homes for the trained mechanics whom they bring from the larger cities, or by a combination of both. We have spoken of such manufacturers as taking their courage in both hands. For, indeed, it needs courage of no mean order, on the part of a manufacturer, to locate in a small centre where none of the residents are trained workmen. But unless this is done, and industry thus decentralized, it is practically impossible for harmonious and human relations between employer and employee to be maintained, and for the workers to obtain something approaching ideal working and living conditions.

For such reasons we consider that for Legislatures to seek to prohibit municipalities bonusing industries is a grave error which must react detrimentally to the best interests, social as well as economic, of the State. In Great Britain, in the United States and elsewhere progressive industrial thought is turning more and more to the decentralization of industry for the solution of many of the most baffling, and even menacing of industrial problems. In such circumstances, it certainly seems somewhat ironical that Provincial Legislatures in Canada should take, or contemplate taking, steps calculated to make industry more highly centralized still, by putting a ban on all bonuses.

A PREMIUM ON CARELESSNESS.

It has been truly said, that the legislation does not offer relief from compensation costs but accident prevention does. As the matter stands now, it seems to us that our legislators have virtually put a premium on carelessness. The amount of indemnity is sufficient to keep a man from starving without the necessity of working, especially a man without family obligations.

The amount of money paid in Ontario and of course in other provinces, for accident compensation is an enormous drain on industry. If this money were expended in plant extensions it would result in greater production and more employment both to these using the new equipment and those engaged in making it. Were it not for the cost of carelessness, our industries would not be forced to make such large reductions in wages as have been necessary. Were it not for carelessness, many workmen would not only be benefited by more continuous employment, but would be saved much pain and their families much discomfort.

The cost of carelessness is not merely the actual money spent in compensation, but includes what may be even a greater item in the loss of production, the disorganization of the plant and the upsetting of routine which is necessary to efficiency.

We are fully in sympathy with the principle of compensation for accidents but are not in sympathy with the compensation for accidents which are entirely due to the carelessness of the individual. In fact, we think that where an accident is due either to carelessness or to deliberate disobedience, there should not be only no compensation paid, but there should be a fine and on the other hand, we think that where an accident is due to negligence on the part of the employer that not only should compensation be paid the injured man but that there should be a severe penalty in addition. Such a measure would help to bring about better co-operation between the employer and the employee with respect to accident prevention and would impress the matter more firmly in the minds of all.

COBWEBS.

Our congratulations to the Toronto "Mail and Empire", 50 years old last week.

A reader in Brooklyn, N.Y., clipped this head line from "Pulp and Paper", March 2nd: "Salesmen eat once a month," and added the remark, "We never realized it was as bad as that."

The United States imported about 18 per cent less paper in the 12 months ending January 31, 1922 than in the corresponding previous period.

Canada shipped only 2-3 as much unbleached chemical pulp in January to the United States as did Sweden, but shipped four times as much bleached pulp.

How about this ? If the United States puts a duty on wood pulp, will this not operate largely to increase the difficulty of the many mills depending on imported pulp in competing with paper from the countries where cheap pulp is available? Pulp mills in the United States can not begin to make enough pulp for their paper mills, and about 20 per cent. of their product is made from imported wood! Who are the people that want that duty, anyway?

DUTY ON WOOD PULP MAY BE BOOMERANG

It looks as though the proposed tariff legislation on imports of chemical pulp from Canada will benefit a few producers of that commodity in the United States, who are also manufacturers, but that a greater number which depend upon the open market for their raw materials are likely to be seriously affected says a writer in a Montreal paper.

In fact, it is believed that not only will a large number of manufacturers of high grade paper be seriously inconvenienced, but that a good many producers of newsprint might be forced out of business as they depend entirely on imports of Canadian raw materials for the output.

They use 80 per cent of ground wood and 20 per cent of chemical pulp in making newsprint, and if the tariff of 5 per cent is enforced they may have to go out of business. This would still further reduce the production of American newsprint and swing the business largely to Canadian manufacturers.

The proposed tariff also provides for a further impost of 10 per cent against imports from countries placing restrictions on exports of raw materials to the United States. This would affect Canada, and would prove prohibitive to American buyers. It looks, in consequence, as though the Canadian situation might benefit in some ways from such legislation, although some exporters of chemical pulp would suffer.

TASCHEREAU TALKS ON TARIFF

Mr. Taschereau, Premier of Quebec, says that the Fordney Bill does not seem very popular in the United States, especially in New England. If the United States insist on raising the duty on all Canadian goods, he thinks that Ottawa will have to impose an export duty on pulpwood. This would seriously inconvenience Americans as they have not enough of their own for domestic use.

ANOTHER MOVE IN THE ATTACK

The Port Arthur News Chronicle sees in the wood pulp tariff a possible pry to loosen up some restrictions on Canadian pulpwood. This paper remarks:

Assurance has been given to pulpmakers in the United States that a duty will be imposed on all woodpulp imported into that country, so it is reported from Washington. Whether the object sought is one for protection of the pulp industry, or the means to an end sought by the pulp makers for the past few years is still to be decided.

Canadian mills are not competing with those of the United States. The paper industry of that country takes the amount of pulp required to make good the deficiency of the domestic mills in meeting the demand. The real competitors of the United States mills, and incidentally Canadian mills, are the liquidating pulpmills of the Scandinavian countries. Pulp from those mills is being laid down in the United States at a price that neither the Canadian or U. S. mills can compete with. The industry in those countries, so it is said, is practically in the hands of the banks, and mills are being forced to sell at any price obtainable in order to wipe out their bank liabilities. How long this process may continue is problematic.

Canadian mill costs are on a level with those of the United States and our mills are therefore not in position to seriously affect the operation of the mills across the line. We must then look for some other reason for the imposition of the proposed duty. Continued operation of many of the U. S. pulp mills is possible only because they draw their raw supplies from Canada. For two years particularly, efforts have been directed by certain politicians in the United States to force Canada to secure removal of the Provincial restrictions on the export of pulpwood. Threats have been made that embargoes would be placed on the exportation of coal to Canada, among other dire penalties, as reprisal for Provincial obstinacy. These not having the desired effect it is now proposed to frighten her into action by imposing a duty on wood pulp.

A year ago Canadian mills looked almost exclusively to the United States for a market for their pulp and paper. In the meantime there has been a decided slump in the amount of pulp sent to that country and Canadian mill owners and managers have been out hunting for new markets. Recent transactions show that other markets can be secured. A duty on pulp might force Canadian mills to extend their search farther afield, but there is this to be said, if the duty is imposed: The bulk of it will be paid by American capital invested in Canadian mills.

Congratulations to the International Paper Co.! The new groundwood mill and one of the 4 paper machines at Three Rivers were started up this week.

The Paper Machine Hood as an Investment.

By H. S. TAYLOR AND H. T. BAKER

Management Engineering and Development Company Dayton, Ohio.

In the operation of modern high speed paper machines the removal of water evaporated from the sheet must be seriously considered. In the earlier days with slow running machines the moisture content was not of sufficient volume to require special study for its removal, but with production increasing 100% or more the volume of moisture has reached such proportions that a serious condition within the room is at once noticeable unless the moisture laden air is removed and its volume replaced with air of a proper degree of temperature and humidity.

If the removal of this water through the medium of air was of interest only as regards its mechanical removal, the study of the situation would end with the installation of positive and exhaust fan equipment of proper capacity for the volume of moisture to be removed, but the fact that the air carrying this moisture must be kept above the dew point adds an expensive element to our study, namely, heat units, which must be supplied to hold a temperature that would otherwise be lowered due to the absorption of moisture, and we all know that heat is a most expensive item, whether in the paper mill, home, or elsewhere.

Howard S. Taylor.

That the removal of moisture from a sheet of paper on the dryers is a large item of expense is perfectly understood by all paper manufacturers, but the fact that the proper removal of this moisture from the room itself is also a serious item of expense is not so clearly understood, and with good reason, for until very recent years very little attention has been paid to the subject, and even today with many satisfactory systems of removal in operation, cost figures for such removal are practically impossible to find.

The purpose of this article is to show in dollars and cents what it should cost for the removal of moisture after its evaporation from the sheet through a system that, in addition to the actual removal, will supply the proper volume of incoming air of a degree of temperature and humidity that will maintain conditions within the room that are suitable for workmen and structures.

There can be little doubt in the mind of anyone familiar with machine room operation that the system of removal should be so arranged that vapor arising from the sheet on the dryers will be conducted to the outside air by the shortest and most direct route and with the least possible delay, and furthermore, that the temperature of the water evaporated from the sheet should be held as near the boiling point as possible throughout its passage to the outside air, for every degree that it is lowered means a drop in the surrounding air, this drop demanding an additional volume of heated air to prevent the dew point being reached and drip resulting.

From a number of tests the average temperature of the vapor just over the surface of the dryers is from 115° to 120° F. and 90% humidity, whereas for proper working conditions air should not be above 80° and 50% humidity for at least 8' above floor level, and in that there is but a few feet difference between this 8' level and top of dryers there immediately arises the problem of holding a temperature head of from 35° to 40°, the difference between the temperature over the dryers and just outside this dryer section. This 80° temperature must not be increased, and it is therefore evident that unless some means are taken to form a separation, the temperature over the dryers must be above 80° at working levels as the lowering of temperature over the dryers means additional heat units, the first stage of our problem centers about a means for holding a temperature over the dryers as far above the outside temperature as possible.

To hold this high temperature over the dryers and seperate it from the lower temperature on either side, one would immediately suggest enclosing the areas just above the dryer section, and through this enclosure conducting the hot vapor to the outside, thus preventing this vapor from coming in contact with the working temperature outside the machine. This, of course, is a common practice in paper machine rooms, a hood forming the enclosure and heated vapor being conducted from this hood through vents to the outside air. With a properly designed hood installed the temperature head can be held to the best advantage, and it is self-evident that the lower the heat conductivity of the hood walls the greater the head that can be held; a saving in heat units that must otherwise be supplied. This non-conductivity of the hood structure is again essential to prevent the escape of heat from within to the lower outside temperature in sufficient quantity to lower the temperature of the vapor within, and thus cause drip from the under side of the hood, a condition noticeable under many paper machine hoods, that is due to the lowering of the temperature within through insufficient insulation of hood structure.

The paper machine hood, however, cannot be said to be popular throughout the industry, there being many manufacturers who greatly prefer to do without it, no doubt for reasons of interference with access to dryer section through overhead cranes or trolleys. As we will show hereafter the removal of water from the room and replacement with dry air can be accomplished without the hood as well as with it, but we will also show that the cost of removal of water and holding working degrees of temperature and humidity are greatly increased in case the hood is not installed. In other words the manufacturer, providing his machine room is kept in proper condition, expends each year a sum of money that is far in excess of any benefit that he can receive by seeing his room clear of what he may call an unsightly structure over the dryer section. The following figures indicate what this saving would be, and the data upon which they are founded has not been assumed, but is from actual tests taken in a number of different machine rooms.

For example, let us take a machine room wherein are installed two paper machines each with a production of 60 tons per twenty-four hours, or a total production of 120 tons. This production is equivalent to 240,000 pounds per twenty-four hours, 10,000 pounds per hour, and 167 pounds per minute.

The moisture content removed through evaporation within the dryer section for different grades of paper varies from 1½ pounds to 2½ pounds of water per pound of paper. For the two machines in question we will take this content at 2.2 pounds making a total of 264 tons of water to be removed per twenty-four hours or 367 pounds per minute. In other words the water that must be removed from this machine room each twenty-four hours would fill a tank 50 ft. square to a depth of 3.4 ft., a considerable quantity, if one visualizes it in such surroundings.

As this 367 pounds of water per minute must be removed in the form of moisture laden air, we must next consider the volume of incoming air that must be continuously supplied as the removal agent; and also the number of heat units that must be intoduced with it, to compensate for the drop due to saturation and hold the mixture above the dew point. There is a point of difference however, in that as the weight of water to be evaporated from the sheet must be constant per ton of product, so should the volume of air supplied be constant irrespective of outside temperatures, but the number of heat units to be introduced with this incoming supply must depend upon its initial temperature; thus with the outside air at a low temperature a greater number of heat units must be introduced than for a summer day when the outside air is at a much higher temperature.

With the machine installation as described, producing 120 tons per twenty-four hours, we will assume an outside temperature of zero degrees. 2.2 pounds of water per pound of paper is equivalent to 2,570,000 grains of moisture per minute that must be removed. With a hood over the machine air will leave at 115° F. and 90% humidity, each pound of air at this temperature carrying 425 grains of moisture and containing 90.5 B.T.U'. s. 425 grains per pound of air compared with a total of 2,570,000 grains per minute calls for 6,040 pounds of air, at 90.5 B.T.U's per pound, 546,000 B.T.U's per minute must be supplied. From tests it is shown that about 1/6 B.T. U. is given off from the dryers for each grain of moisture evaporated, a total of 430,000 B.T.U's supplied within machine room. This number deducted from 546,000 leaves 116,000 B.T.U's per pound of air, this air being delivered in the room at a temperature of 80° F.

6040 pounds of air at 80° is equivalent to 92,,500 cubic feet per minute, approximately 700 ft. per minute per daily ton. This supply, however, provides only for the dryer section, and we must add an additional supply to take up the moisture arising from wire, showers, and hose connections at wet end, and from tests we find that 25% added will remove all moisture and also provide for roof insulation. This additional quantity would increase the supply to 104,125, or say 108,000, cu. ft. per minute equivalent to 900 ft. per minute per daily ton.

Heat units to be added from outside sources with this additional supply are increased from 116,000 to 150,000, and to replace heat loss through walls and roof with an outside zero temperature 20,000 additional should be added, or a total of 170,000 B.T.U's per minute, equivalent to 10,500 pounds of steam per hour, or 305 boiler horse power at 34.5 pounds per hour with outside temperature at zero.

So much for an installation with a hood. For one without a hood the limiting feature is the temperature and humidity of the moisture laden air under roof slab, this moisture being carried to a great extent throughout the entire room. Under this condition temperature over dryers under roof slab must be reduced from 115° F. and 90% to about 105 F. and 80% humidity—a well insulated roof permitting 105° F. to be carried and the mixture held above the dew point.

Air at 105° F. and 80% humidity will carry 282 grains of moisture and 67 B.T.U's per pound, with a total of 2,570,000 grains at 282 grains per pound, 9,120 pounds per minute of dry air is the theoretical supply indicated, but since without a hood the removal process is almost entirely one of absorption the entire volume of this theoretical supply cannot come in contact with the moisture. An additional volume must therefore be added and it has been found that with the theoretical supply representing 2-3 of the total demand the best results are obtained. 9,120 pounds will therefore represent 2/3 of the supply demanded for dryers alone. 9,120 pounds at B.T.U's per pound or a total of 613,000 B.T.U's therefore represents 2/3 of the air supply. The 2,570,000 grains given off from the dryers will contain 430,000 B.T.U's as in the case with hoods the difference to be supplied from outside sources will be 183,000 B.T.U's per minute for 2/3 supply equivalent to 19.9 B.T.U's per pound of incoming air or at a temperature of 81° F. With 9,120 pounds representing 2/3 supply, total supply will be 13,700 pounds, containing a total of 274,000 B.T.U's, and equivalent to 187,000 cubic feet or 1,560 cubic feet per daily ton. As in the case with hood 25% must be added for wet end and heating effect making a total of 235,000 cubic feet per minute or 2,000 ft. per daily ton.

Heat units to be added from outside sources with this additional supply are inceased from 274,000 B.T. U's per minute to 340,000 B.T.U's per minute equivalent to 610 B.H.P. in place of 305 for hoods, a difference of say 300 B.H.P.

Therefore for a day with outside temperature of zero 300 B.H.P. would represent at 30 lbs. per hour 216,000 pounds ofsteam and at, say 80 cts per 1,000 pounds, represents an expenditure of $172.80 per day, this figure representing cost of removal with hoods, and also the additional cost if hoods are not installed. On a yearly basis an average temperature of 40° F.

can be taken for Maine, northern New York and southern Canada, 40° F. representing 150 continuous B.H.P. or $25,920.00 per year, expended for heat to replace hoods. Considerably less than half this amount would buy and install two hoods,and no better saving on an investment can be shown elsewhere in the mill.

The system of removal on which the above figues are based are of standard equipment, including positive blower equipment with heating coils for replacement air and exhaust fans for removal, these exhaust fans in case of installation with hood being installed in vents, and in roof or wall openings if no hood is used. It may be said that costs can run much in excess of those above tabulated, and without doubt do run higher in many machine rooms where either volume of delivery air is greater than necessary, requiring an additional quantity of heat units, or where a system of direct radiation is used to protect roof slab by providing that the room is kept dry. We must also state that for figures given above building walls and roof must be of good construction without excessive glass area and roof well insulated, otherwise heat losses through walls and roof will be increased and additional heat units must be introduced with incoming air to compensate for loss, thus increasing the cost of removal.

A question may be brought up here with reference to a system of heat conservation now on the market known as the "Briner Economizer." This system is designed to transfer heat in the outgoing vapor to the incoming air supply, thus greatly reducing heat units that must be supplied through outside sources, and without doubt this system will show excellent savings, but it will not lower the differential between cost of removal with and without hoods, and this element of cost is that referred to in this article. This economizer system, as with any similar system, must depend to a great extent on hoods for its success and without doubt the manufacturers will agree in the statement that the differential of removal with and without hoods will be greater with their system than without it, although showing an extremely attractive saving in either case.

In as far as the paper machine hood is concerned any distinct disadvantages will be difficult to find in a properly designed installation. Hoods may be so built to allow access to any part of the dryer section and vents so built that an overhead crane will have free travel to any part of the room. It is true that it would be much more difficult to remove a dryer with a hood installed, but the actual removal of a dryer only happens once in years, and should this occasion arise the section of the hood over the dryer in question can be removed.

Many manufacturers will doubtless say that it is not costing them any where near the figures given above to keep their machine rooms from dripping and this statement may be perfectly true. There is, a difference, however, between keeping the machine room dry and keeping it without actual drip. In the first case moisture is removed from the room and is not present to saturate the roof and wall structure, and be the cause of high degrees of humidity throughout the entire room, whereas in the latter case the entire structures become moist and either saturated or partially saturated, ths greatly reducing their life and causing high maintenance costs as can be shown by the number of machine room roofs that are replaced in a comparatively few years after orignal installation.

Very little attention has been paid to the hood structure itself. One can find them built of anything from paper to scrap iron, and many of them are highly inflammable. The dryer section is the one location in the paper machine where there is always the greatest fire hazard, with the result that they are generally well sprinkled, the piping on the under side being a pronounced source of condensation and resulting drip. This hood structure can be designed to cause practically no interference whatever with the machine, and if it is true that it will cause no interference and will represent a considerable saving, why should it not be considered as much a part of the machine room structure as the wall, floor or roof, and be constructed of durable, fireproof material that is sufficiently nonconductive to hold the maximum temperature head. Such a structures can be installed that will fulfill these conditions, and at the same time be of such an appearance that it cannot in any way disfigure any modern machine room, and will show a saving that tractive to any owner from an investment standpoint. must be attractive to any owner from an investment standpoint.

BOUNTY ON PORCUPINES TO SAVE THE TREES

On account of the large amount of damage being done in the woods by porcupines, I will personnally pay a bounty of ten cents each for every porcupine killed during the month of April, 1922, anywhere within the Province of Nova Scotia. By actual count it has been found that a porcupine will destroy about 100 fully grown trees in a winter,so that the total loss from this animal runs into very large figures. Every fully grown tree that is saved is worth more for present needs than 100 seedlings planted, though both are urgently needed.

No bounty will be paid after May First, on account of the added fire risk caused by having hunters in the woods after that date.

An extra cash bonus of one hundred dollars will be paid at the end of April to the one who actually kills the largest number during the month. In the event that two contestants should kill exactly the same number the bonus will be paid to the one who sends in the largest returns early in the month before the female reproduces.

All that will be necessary will be to cut off the snouts and forward same by parcel post or express to me at Annapolis Royal, Nova Scotia, stating location where porcupines were killed and giving name and address of the sender, and a check for the bounty will be forwarded by return mail. As porcupines are quite plentiful in many parts of Nova Scotia, hunters and a large number of the unemployed should make good wages out of this bounty and be at the same time saving their own or their neighbors' trees from destruction.

Porcupines cannot throw their quills, this is simply an old superstition, you have to come in actual contact with the animal before it can shed its quills. They are comparatively tame and can often be killed with a stick.

I intend renewing this offer in the fall after snow comes again. *Frank J. D. Barnjum.* Annapolis Royal, N. S., April 3, 1922.

ALKALI RECOVERY IN THE SULPHATE PROCESS

One of the most unusual pieces of advertising that we have seen in some time is the excellent exposition of this problem of the recovery of chemicals in the sulphate process which has been written by Clinton K. Textor and is published and distributed by the Alberene Stone Company, 223 East 23rd Street, New York City. It will be well worth the while of anyone interested in the sulphate pulp industry to have a copy of this pamphlet.

PROMINENT JAPANESE VISITORS

Several Canadian paper mills were honored this week by a visit from a party of prominent Japanese paper makers. The visitors are Mr. Ginjiro Fujihara, president of the Oji Paper Manufacturing company, the largest paper company and one of the largest industrial enterprises of Japan; Mr. Yasunosuke Fukukita, purchasing manager; Mr. M. Tanaka, of the labor and investigation department, and Mr. R. Takata, construction and operation engineer of the company. Mr. Takata is to remain in America for several months, most of the time at the plant of Finch, Pruyn & Co., at Glens Falls. N. Y. The rest of the party sail April 20, from Vancouver, on the Empress of Asia.

Mr. H. B. Wadsworth entertained the visitors and a few friends in Montreal at luncheon on Monday. The editor was glad to see Mr. Fukukita again and to hear from other friends in the land of cherry blossoms. Mr. Wadsworth is well known in Japan, where he supervised the erection of several Bagley & Sewall machines of which Mr. Fujihara's company has 12. Mr. Wadworth's company represents the Oji Paper Manufacturing Co., in America.

The Oji Company makes about 60 p.c. of the paper made in Japan and is planning a fine new mill. The new high speed and wide machines recently installed in Canada will receive their interested attention.

Since leaving Japan last fall, the party have visited England, France, Belgium, Germany, Sweden, Norway, the United States, and Canada.

Readers of the Pulp and Paper Magazine will be interested in a brief review of the operations of the Oji Paper Manufacturing Co.

THE OJI PAPER MANUFACTURING CO.

The Oji Company makes about 60% of the paper facturing Company, Limited) which is the oldest joint-stock company in Japan in the modern sense, was organized in 1872. It is the first concern in this country to manufacture European papers as distinguished from what are generally known as Japan papers.

The Oji Paper Manufacturing Company started its business with a capital stock of Yen 150,000 ($75,000), and is to-day the largest concern in this line of business. The subscribed capital of the company is at present Yen 50,000,000 ($25,000,000), of which Yen 31,250,000 is paid up. In its history of nearly half a century the Oji Paper Manufacturing Co. has had some gloomy days, the capital stock having cut down to Yen 500,000 from Yen 2,000,000 in 1899; but its business has since steadily prospered.

In addition to ample provisions made for depreciation and reserve funds year after year, which strengthen the company's financial standing more and more, its shareholders have received dividends at the rate of 25 per cent per annum for the past five years. The fact that the sum of Yen 10,450,000 is set apart as reserve funds and that about Yen 11,000,000 has been written off for depreciation since 1912 will give a general idea of the sound business policy, which the company's Directors have been so successfully pursuing for a number of years.

The following summaries will give an idea of the activities of the Oji Paper Company not only in the paper industry strictly speaking, but also in the pulp industry and electrical enterprises.

OJI MILL has 3 paper machines, two—98" and one —84" Fourdriniers. The annual output is 24,000,000 pounds of book paper.

JUJO MILL has 4 paper machines, one—100" and three—86" Fourdriniers. This mill makes book paper and post card paper, with an annual output of 48,000,000 pounds.

OSAKA MILL has 6 paper machines, one—86" and two—74" Fourdriniers and one—96" and two—72" cylinders. The annual output is 20,000,000 pounds of book paper, cigarette paper, and celluloid paper.

KETA MILL has one—78" Fourdrinier and one—72" cylinder machines, and makes 7,000,000 pounds of wrapping paper, match paper, etc., annually. There are ground wood and sulphite mills manufacturing pulp required by the paper mill.

NAKABE MILL has one—88" Fourdrinier machine and one—72" cylinder machine. The annual output is 9,000,000 pounds of book paper, wrapping paper, etc.

There are ground wood and sulphite mills manufacturing pulp required by the paper mill.

TOMAKOMAI MILL has 8 Fourdriniers paper machines, four—142", two—100", and two—98", news print paper and wrapping paper are produced, with an annual output of 150,000,000 pounds.

Attached to the paper mill, there are large and up-to-date plants manufacturing the necessary quantity of ground wood and sulphite pulp.

SULPHITE PULP

The company operates three sulphites mills in Karafuto (Japanese Saghalien). Easy bleaching sulphite turned out by these plants compares favorably with products of any first class Scandinavian mills. The THREE STAR BRAND is well known at home and abroad.

ODOMARI MILL makes 10,000 tons of easy bleaching sulphite pulp.

TOYOHARA MILL has an annual production of 20,000 tons of easy bleaching sulphite pulp and 6,000,000 pounds of wrapping paper.

NODASAM MILL produces easy bleaching sulphite pulp with an annual output of 10,000 tons.

SUBSIDIARY COMPANIES

There are three separate concerns, whose Boards of Directors are controlled by the Oji Paper Manufacturing Company. So far as the operation of enterprises is concerned, the following may therefore be considered the holding company's own plants.

CHOSEN SEISHI KABUSHIKI KAISHA Shingishu, Chosen (Korea) Shingishu Mill makes 10,000 tons of easy bleaching sulphite pulp. Bales of sulphite bearing the THREE TOMOYE BRAND come from Korea.

KABUSHIKI KAISHA YUKOSHA, Tokyo, has one —60" Fourdrinier paper machine, producing 3,000,000 pounds of book paper annually.

HOKKAI KOGYO KABUSHIKI KAISHA, Fushiki, has one—100" Fourdrinier paper machine and makes 12,000,000 pounds of news print paper.

Besides his heavy duties as head of this great paper company, Mr. Fujihara is a director of the Electro-Chemical Manufacturing Co., with a capital of Yen 25,000,000 and of four hydro-electric companies, with an aggregate capital of Yen 23,000,000. He is president of the Gifu Hydro-Electric Co.

THE DEAN OF THE INDUSTRY IS 95.

John R. Booth, President of J. R. Booth, Ottawa, famous as Canada's lumber king and multi-millionaire pulp and paper manufacturer, was born in Waterloo, Quebec, April 5, 1827. When twenty-three years of age, he went to Sherbrooke and near-by districts, and finally to Ottawa, where he helped in the construction of Lemay's sawmill, and soon after went into business for himself.

Our hearty congratulations are extended to Mr. Booth and best wishes for continued good health.

Transactions of the Technical Section.

Discussion of Papers at Annual Meeting

(Continued from last issue.)

THE UTILISATION OF JACK PINE IN THE MANUFACTURE OF NEWSPRINT.

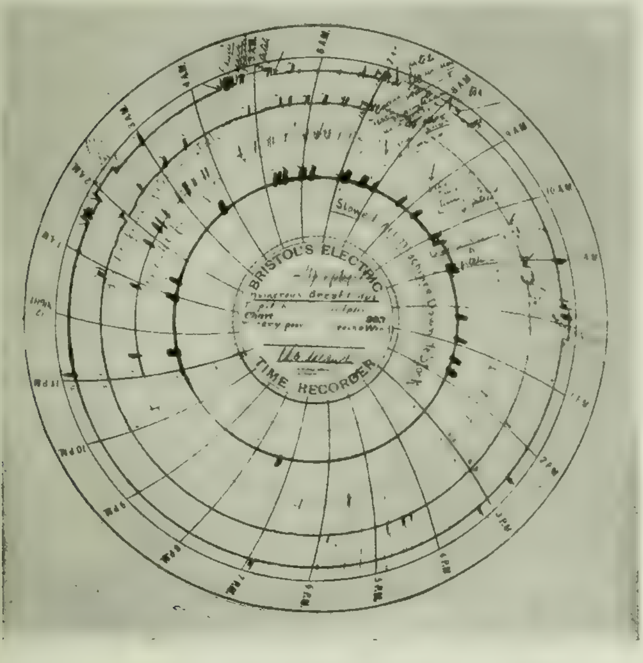
MR. MAURICE NEILSON: The Belgian Industrial Company, Limited, presented a paper on "The Utilisation of Jack Pine in the manufacture of Newsprint." It was published in the Pulp and Paper Magazine for January 26, 1922.

Mr. Neilson's paper was illustrated with slides and samples of jack pine sulphite and newsprint. The two cooking charts reproduced herewith were not printed with the paper.

MR. CARRUTHERS: You have heard Mr. Neilson's paper on the handling of jack pine; are there any questions to be asked?

MR BRYANT: May I ask Mr. Neilson how long that jack pine had been seasoned?

MR NEILSON: It had been seasoned at Three Rivers from the Fall previously. It arrived at the mill near the end of February.



Paper machine chart, Feb. 23, 1921. Numerous breaks due to pitch in sulphite and very poor ground wood.

MR. STEPHENSON: On the question of the relative pitch content of spruce and jack pine does it not appear that your ether-alcohol extracts were not exactly comparable in that you showed the ether extract in new spruce as compared with that in stored jack pine, and you mentioned the effect of the oxidization, or changing of the character of the resins, so that the ether-alcohol extract might be expected also to vary.

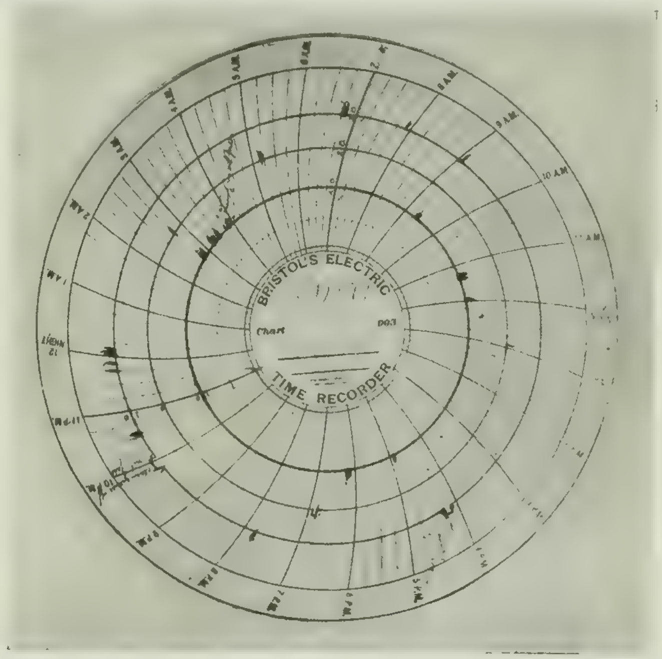
MR. NEILSON: But you have the same amount of ether-alcohol extract whether you have it oxidized or not.

MR. STEPHENSON: But you would have a different character of resin.

MR. NEILSON: Yes, this table only showed the total amount of ether-alcohol extract. Of course, the character of the pitch in the spruce would be different from that in the jack pine.

MR. STEPHENSON: As I recall some of the work that was done in the Forest Products Laboratory some time ago, the amount of resin soluble in ether-alcohol varied with the age of the resin or with the length of time during which it ad been oxidized. Perhaps Dr. Bjarne Johnsen would give us some information on that point.

DR. BJARNE JOHNSEN: It is a question of quality rather than that of the quantity of the extract after seasoning. Resin is a mixture of rosin and fat. In fresh wood we find about fifty per cent of fat and fifty per cent of rosin. I do not recall the exact figures but I believe that jack pine has more than fifty per cent of fat. This portion of the resin is considered injurious as far as pitch troubles go. When the wood is seasoned there is an oxidation which changes the nature of the resin in such a way that the ether extract will decrease while the alcohol extract will remain the same or may even increase. It is very necessary in making these extracts not to talk about ether-alcohol extract but ether extract and alcohol extract. It is also advisable to divide the extract into petrolic ether-soluble and non-soluble extracts. I believe the reason Mr. Neilson did not have any pitch trouble with his experiment was that the wood was not cooked very far down; in other words, I believe it must have been a very hard fibre and it is said that with hard fibre there is not very much pitch trouble. I think the figure of twenty-three per cent for screening is rather high.



Paper machine chart, Mar. 14, 1921. Breaks at 4 A.M. while cleaning 3rd felt; 4 P.M. bolt broke in 3rd press bearing; 10 P.M. cleaning grease off 2nd felt.

I think that means cutting down the digester capacity tremendously and this question should be considered in determining the value of the raw material. Most mills have not any too much digester capacity and are therefore forced to use a rather short cooking time resulting in the low yield and high percentage of screenings. 15 p.c. screenings with a cooking time of 9 to 10 hours; and 23% screenings with cooking time of 8 hours does not, in my opinion, look very attractive. It would have been interesting to have the quality of the pulp obtained with Jack Pine, especially the beating quality and the strength.

I make this suggestion because it very often happens that in investigating the value of a raw material, or a cooking process, we are satisfied with determining the yield while we do not pay enough attention to the quality of the final product. Unbleached pulp does not represent a standard product because it may contain a great percentage of the impurities of the wood. Bleached pulp approaches more a uniform product but should be tested for whiteness, strength and beating quality.

In this connection I am reminded of one excellent piece of work done by the Forest Products Laboratory at Madison, in which the yield of the various woods in sulphite and soda processes is determined. Some of the results were rather surprising and undoubtedly due to the fact that the yields were based upon unbleached pulp, which is by no means a standard for comparison. I just wanted to mention this as a suggestion for future work along similar lines.

MR. NEILSON: I am afraid Mr. Johnsen did not have the right figures on the yield. The 23% of screenings refers to the eight-hour cook and the 14.3 per cent to the ten hour cook. The amount of screenings also depends on the screening capacity. If you make the cooking on a small scale, you will get a smaller percent of screenings than you will get in actual practice. In the mill you are anxious to keep the stock clean and sometimes you will get a lower percentage of screenings than at other times. As for comparing the screenings from long and short cooks, we are not making book paper, we are making news.

MR. WARDLE: I hope, Mr. Chairman, you will excuse me for anticipating, but, as you know, we have Mr. Rue of the Forest Products Laboratory at Madison, Wisconsin, and I think we should like to know what his results have been as compared with those of Mr. Neilson's.

MR. RUE: I would be very glad to say something on the subject if I knew of anything to say. The trouble is that we have not yet got into this subject. I have come as a listener to get as much information as I can with regard to this problem. We have made a few cooks along our regular lines of cooking various species of woods, but that work does not answer the question as to the difficulties that may be met with from pitch.

MR. CARRUTHERS: Are the any representatives of the Wayagamack mill present? Or, are there any other contributions to this discussion?

MR. HOVEY: We have done a little work on the grinding of jack pine in small quantities. I was interested in hearing what Mr. Neilson said regarding freeness. We ran our jack pine through practically the same process as spruce and very close records were kept not only of freeness, but of the strength of the groundwood. Freeness is not a definite thing alone, but, combined with strength, is a very good indication of groundwood quality. At the time of our experiment we had a very slight rise in freeness during the period of the grinding of the jack pine, with about five per cent drop in strength. Jack pine was run in the mills on two different days for a period of six and eight hours and it was about twenty per cent of the total groundwood produced. At the end of the second day some of the clothing on the machine had to be taken off; it resembled fly paper very much and gave considerable trouble. Our experience in grinding jack pine in any quantity is that you are bound to run into this fatty-rosin substance and if you remember what sticky fly paper is like you will have a clear idea of what this product is.

MR. STEPHENSON: Was that fresh wood?

MR. HOVEY: It was wood cut the previous winter, brought into the mill last summer and used this winter.

MR. STEPHENSON: Somebody made the remark this morning that in view of the large amount of screenings, and some other difficulties which had been experienced, such, for instance as lower digester capacity, the solution of the question of the utilisation of jack pine might not occur in the immediate future. In this connection I would like to recall the suggestion made by Dr. Johnsen four years ago that the wood be segregated as to species during logging operations, the jack pine sent to the sulphite mill and the other species sent to both the sulphite and groundwood mills.

MR. SHIPMAN: I think that before the consideration of the use of jack pine be abandoned by any individual or company based solely on the increase in the percentage of screenings, one has to consider the number of dollars lost from decreased digester capacity as being balanced against the number of dollars saved in the woods department owing to their being able to cut more wood from a certain area of the camps. There are factors that we do not want to forget.

MR. BRYANT: One of the greatest problems is to cook unseasoned jack pine properly. It is pretty well established that if there is an opportunity of seasoning jack pine there will be very little trouble on the paper machine due to pitch. The problem is to take jack pine from the river, put it directly into the digester and produce a pulp which can be used on the paper machine.

MR. NEILSON: As a matter of fact, we have been doing that right along. The amount of jack pine that has come into the mill has been, in some periods less, and in some periods more, but we have been actually using jack pine in the sulphite mill up to as much as forty per cent together with the spruce which had been coming in during the summer and fall. Any wood that comes in after the first of June is used right along. We have made tests of cooking spruce and jack pine together, but we have found htat it is not a very desirable thing to mix spruce and jack pine. A friend of mine the other day related to me an experience he had had as a grass widower. He was cooking a meal, he wanted to hurry it up so he cooked in the same pot potatoes and turnips. He found when the potatoes were cooked that the turnips were still raw, and that when the turnips were cooked the potatoes were in mush form. The same thing happens when you cook spruce and jack pine together. From the experience we have had in our groundwood mill, we find that we can make better use of the jack pine if we can segregate it. We have not had the trouble that Mr. Hovey has had. We are experimenting with jack pine in our groundwood mill, using quite a large percentage, and so far we have not had any pitch troubles. Perhaps we shall if we increase the amount of jack pine.

MR. CARRUTHERS: Have you had any experience in this line Mr. Hinzke?

MR. HINZKE: I have had a wide experience with a great many grades of wood, but unfortunately jack pine is not among them. I tried to make an experiment with all these woods; that was caused by necessity. At one mill we had a flood, the boom broke and we found ourselves with a great amount of tamarac and poplar on our hands. We did not know what to do with with the stuff so we thought we would go in for an experiment, make a number of cooks and see what would become of it. We left the tamarac to the last. First, we started on the poplar with the sulphite process and the results were excellent as far as the poplar was concerned. We had 16-ton digesters and our hemlock output would be about fourteen and a half tons. The poplar would give almost as great an output as spruce which was about 15½ tons. With the tamarac, which I undertook to cook last, I met with some difficulty. In the first place, I could not get the acid quite strong enough. I could get the acid strong enough for one cook, but I could not get any of the relief gas back in the return to hold the acid constant. We had four digesters and in a month we cooked four different kinds of wood, spruce, hemlock, poplar and tamarac. When the acid was weakest I would start the spruce digester and get enough of the relief gas back to fill up with the other wood. The pulp from all these different kinds of wood was bleached afterwards. The poplar took a very small per cent of bleach not running over ten per cent, while the spruce would run from twenty-three to twenty-five per cent. The tamarac could not be run over the machine in an unbleached state. It had a very long fibre and the color was such that it took twenty-five to fifty per cent of bleach. We got a very fine fibre. We had a big contract with a music sheet publisher for paper to be perforated for player pianos and it was necessary to get a paper strong enough for this purpose, something in the nature of a bond. The bleached tamarac pulp was piled up on the screening floor and the man operating the paper mill was loath to use the pulp because he did not want to make an experiment. The pulp had a hard, strong feeling and I tried to persuade him to use it on the music sheet order with which we had so much difficulty. He did use it and it was a success. It cost the manufacturer considerably more than spruce pulp. Probably from thirty to fifty per cent of that pulp could be used for bonds. Sulphite poplar pulp is very much harder than poplar cooked by the soda process. We tried some specialties and experiments in the cooking of poplar and tamarac but we did not care to go ahead any farther because so long as we could get hemlock or spruce we did not think the time had arrived when we would be justified in undertaking to cook tamarac on any very large scale. Personally, I believe that almost any kind of wood can be cooked. There was an experiment station in Wisconsin, and, when they gave up the station, they had quite a lot of cottonwood left over. Cottonwood is a species of poplar. I cooked one digester of that wood with the sulphite process and it was some of the finest fibre I ever produced. This can be used in all the different grades of paper with good results. It was very easy cooking as it shortened the cooking time and it cooked with the weakest kind of acid that we ever attempted to use with any kind of wood.

MR. RUE: I would like to ask Mr. Neilson whether he has attempted to reduce the screenings by a little preparation of the chips under pressure prior to the cooking process.

MR. NEILSON: No, we have not gone into that. The experience in other mills is that that would increase the yield.

MR. HINZKE: I think the length of the chips has a great deal to do with the length of the cook especially with those kinds of woods which are the hardest to separate. In one mill they cooked chips about three inches long: the average is three inches.

MR. BARLOW: I would like to ask Mr. Neilson if he cuts the chips of the jack pine the same size as he cuts the chips of the spruce.

MR. NEILSON: We cut the same as we do ordinarily. They are not, of course, all the same size, but vary from half an inch to an inch. I was wondering whether, if you were to experiment in reducing the size of the chips, it would reduce the amount of the screenings.

We conducted a few experiments on Jack Pine cooking in a small autoclave. We found that the sapwood cooked easily while the heartwood was difficult to cook. This explains some of the tailing trouble. We took some alcohol extract of Jack Pine and put it into an autoclave with sulphite liquor and heated to 170deg. C. to note effect. We confirmed previous investigations that the pitch is very little attacked. About 4 per cent went into solution and 4-6 per cent. came over as a terpene appearing steam distillate. The residue was very sticky and difficult to handle.

WHERE DO WE STAND?

The following discussion was one of the most important features of the meeting.

M. CARRUTHERS: Now, Gentlemen, it is sometimes a good idea to have a little self-examination, and it has been suggested that we ought to make an appraisal of ourselves to find out if we are drifting or if we are proceeding along right lines. One gentleman who has taken a lively interest in all matters pertaining to the paper industry is Mr. R. A. McInnis of the Abitibi Company, and he has kindly consented to open up this discussion. I believe this is an opportune time to do it. The subject of the discussion to be opened up by Mr. McInnis is "Where do we Stand? Are the problems of our industry developing so rapidly that the technical men are unable to keep pace with them, or are the technical men in advance of the industry?"

MR. R. A. McINNIS, Manager, Abitibi Power and Paper Company: Mr. Chairman and Gentlemen, I want to excuse myself for attempting to take part in this discussion, because I do not feel that I am as capable of criticising the technical man as he may be of pointing out my own faults and shortcomings. Let me assure you at once that I do not intend to criticise him. Nevertheless, there is a great deal of discussion going on at the present time in the various mills as to the part the technical man is playing and it is probably not inopportune that this matter should be considered at the present time. I want to impress on everyone here the fact that this question is full of complexities and has many contentions sides, and you will have to remember that I am looking at it somewhat from the outside; in other words, from the viewpoint of the management rather than from the viewpoint of the technical man although I shall endeavour to consider his viewpoint also. I want to emphasise the fact that it is a complex question and you will have to bear with me accordingly. That there may be no doubt about how complex it is, I will illustrate the point by an experience of my own. When I was a little younger, and when I thought I could arrange my own life according to the facts that I could pick up for myself, a friend and I decided that we would study all the religions in the world and pick out the best. We spent two winters studying the various religions in the world, we made some very interesting comparisons, and when we got through we were unable to agree. The only reason we were unable to agree was that we each had a different idea of what we wanted to do. I personally thought the Mohammedan religion as the best, but he did not agree. It was settled in the way that most problems are settled; he resigned from the church and I got married and my wife laid down my religion for me after that.

I might also illustrate how complex the question is by stating that while I consider Mr. Hovey very intelligent, yet I have talked this matter over with him on three different occasions over periods of time lasting anywhere from one to three hours, and at the end of the last conversation all that I was able to get him to say was "You have been saying that so often that I have become tired of hearing it, and therefore I am inclined to agree with you."

Now, we can start in. In order to really start a good discussion, I have decided to give you my conclusions, first, or certain of my conclusions, and they are as follows: (I am referring largely to the technical man in the industry. I am not altogether sure myself whether I mean just in Canada or in the United States and Canada. I was asked that question.) In any event, my conclusion is that the technical men as a group are not keeping pace with the demands of the industry. A second conclusion is that the technical men require leadership in this industry. I am not going to say at the moment who is going to provide the leadership. My reason for coming to these conclusions is based on two premises. The first one is this, and remember that I am looking at it from the viewpoint of the management: I have taken all the published articles that have appeared in the Pulp and Paper Magazine of Canada during the past two years, and, while I have no intention of decrying these articles or intimating that they are not valuable treatments of the subjects with which they deal, I want to point out to you that if you look them over you will find they indicate a very wide range of thought and you will also find that quite a number of them deal with matters that are not at the moment in the minds of the management. They may be some day, but at the present time we are not thinking that way. That is probably our fault.

That is the first basis, and the second is the standing of the technical men in the various mills in the industry in Canada to-day. I think that the technical man is not very firmly established yet and I also feel that in a general way the technical side of the business is still in its infancy, for which there are reasons. I do not at all blame the technical man for that. I feel that he is not to be criticised or censured if that is the case. I merely state what the conditions are as I see them. The first reason, as I look at it, is that the technical man has wandered all around the industry, far afield in some cases from the more immediate problems, and the reason why the technical man has wandered is that, like everyone of us he has a certain service to sell. He has to make a living and he has to make more than a living. He wants some honor, some glory, some remuneration and he is going to give or sell what he has just in accordance with the way it is demanded or where he can find a market for it.

I might cite to you the mining industry which I am closely connected with because we live in the middle of it. In the mining industry, practically everyone of the men you meet, whether mine manager or superintendent, is an engineer or a chemist. All have technical training and the mining industry is very largely managed, operated and directed by technical men. The reason for that is that the technical side of the mining business is more highly developed in a general way than is that of the paper industry and they naturally look to technical men for their leaders.

The same thing can be said of the electrical industry. In our industry the situation as yet is different and technical men have not assumed the leadership that they have taken up on themselves in the two industries to which I have referred. Of course, there are exceptions, and the conditions are not always identical. I do not blame the technical man very much if he does not always solve the problems that the management are immediately interested in. In addition to that he is handicapped for lack of equipment and facilities for doing his work.

I have mentioned immediate problems. I do not propose to stand up here and state in detail what the immediate problems of this industry are because they vary according to the condition of the industry, but in our mill we have certain problems that we think are of the first importance, and, in a general way, that would be true of all mills. I would say so far as the management are concerned, that the term "immediate problems" might be covered by the words, "quality, economy and production." In other words, whether it is at the operative or technical end, anything that does not immediately assist us in these three things, particularly at the present time, is not apt to be given very much consideration.

I have covered the general situation as I see it. Now, I want to try and cover what might be considered the remedy and in order to do that I think it would be better for me to take our own mill because it prevents the possibility of someone getting up and citicising my statements as not being applicable to different conditions. In our mills we look at it in this way: We do not care what the technical man may want to do untimately; they may want to reorganize the universe, but that is of no interest to us. The first thing we ask our men to do is control work. We say: You go out and find how to control the present irregularities in operation. That naturally requires men, some of whom are mechanical engineers and some of whom are chemists. They go out, start in on this control work, find the cause of some of these irregularities, they begin to find the remedies for them and ultimately they get things worked out so that it is possible to secure a more or less established routine. But as they go along on this control work they find that they have to undertake a little investigation; in other words, they have to go back and find the laws that are involved in the particular lines of production. They go to work, seek these laws out and ultimately apply them to the operation of the plant. But, beyond that, there is a further stage. It is all working from the inside outside. After the staff get these laws worked out they find that they have to go further in investigational work. They have to do some real research to find fundamentals which are involved, and they begin by putting their chemists to work. That takes some time.

The point I am trying to make in this brief survey of our way of looking at it is that from the management's viewpoint, we want the technical men to help us on our immediate problems and that when they get these straightened out they can go back to the research work which is so essential to this industry. That, I think, covers in a general way the argument for the application of technical knowledge to our immediate problems.

Now, that brings me to the next point. There is no doubt in my mind that in this industry we need more information along specific lines. I could illustrate that in a number of ways but it is hardly necessary. I will repeat there is hardly a day but we need information on a number of subjects along more specific lines. Some means should be provided whereby this industry could get this information. A number of ways will suggest themselves to you. There is great room right here for contentious discussion. A private firm who have an organized service themselves will maintain naturally that the way to solve these problems is to turn them over to certain firms who have processes along certain lines or are connected with private research companies who will investigate your problems. All of these methods of course, have their place and cannot be criticised. Then again, there is the old story of the Central Research Bureau, but whatever means may be considered, some means should and must ultimately be provided for this kind of work because it is impossible for any private organization to maintain at great expense the staff and facilities for doing this work itself. It would mean that we would be a very long time in doing this work or it would be done at tremendous cost. In order to allow the technical man to do this investigational work we must provide facilities. The point I am trying to make is that we must either provide in our own plant the necessary equipment or it must be provided outside. You will realise that I am just touching on this matter very generally and I have very good reason for doing that because I realise that it is rather a broad subject.

Now, I want to change my thought, and point out what I consider to be one of the greatest problems in connection with the technical men and the management. The management of this industry has been pretty severely criticised by reason of the fact that the first thing it does is to cut off the technical man. In my opinion, what the technical men require is organization and, if you want me to be more specific, they require organizers among themselves. A large company, whether it is in the news business or the book business or whatever it may be, appropriates an amount of money and says "Let us keep these brains in the business and set them to work to solve our problems." They get a group of technical men, set them to work in the plant and say "Go to it." That is all they say. These men may be able to study these problems, may be able to develop them, but unless they have some one in their group, a man of executive ability or of organizing ability who is still a technical man but who is able to get out in the mill and with the assistance of the management and the operators apply these conclusions, there the value of that work will be lost. That is the view that appeals to me, it is a very important point and one that we should give serious consideration to.

Management has a Responsibility.

Now, the management have a grave duty. I think we have a greater duty than we have probably realised. I feel that it is up to the management of the organizations in this paper industry to provide in a general sense leadership for the technical men, but it can only be provided through a technical organizer or executive. The management will never have time to sit down and thoroughly understand in all its detail and ramifications just what is going on. They must depend on the technical man himself to so organize his work that it can be utilised or put over. The management must provide leadership in telling at least very clearly what they require.

The management has even a greater responsibility than that. I have no idea just what every mill is discussing, but I do know that at the present time the question of conservation and increasing the yield of the forest, is a mighty important one to this industry. At the same time, while the forester may be able to increase the yield of the forest, he also wants to encourage the use of other materials in addition to that which we are already using, and unless management prepares for this in their operations, then, forestry will lag behind until developments occur that make it necessary to use various grades of wood, such as the jack pine, poor wood, rotten wood, and a whole lot of other stuff. You can see what I am trying to get at. That is the question that is interesting the management to-day.

There is the forester working on the one hand and the technical man working on the other, and unless there is more coordination of their efforts, one is going to be very much behind, or very much ahead of the other.

In order that the management may understand its responsibility, once again going back to the organizing of the technical section, the management must be thoroughly disabused of the idea that a technical man is a failure unless he can go right out into a paper mill, or a sulphite mill and, after some study, become an expert operator. I do not agree with that at all. I believe that there is a great deal in experience, and I will tell you about a little session I had with our fellows one time when we were discussing a paper machine. The general feeling was that if a paper machine were turned over to a group of technical men in a short period of time they would be able to operate it more scientifically and more expertly than the average operator. When you begin to check back on these things and get the checking back to the actual facts you find that all the expert, or technical man can do in the operation of a paper machine is to tell you what should happen, and if there is trouble he may be able to find out what is the matter a little quicker. If he has no device that will show in definite terms what has happened, he cannot wait to make the tests but he must go to work and fool with it in the same way that the operator does. Therefore, you can see why the management will hesitate to a large extent in choosing between practical experience and technical experience. There is no reason why the technical man cannot become a good operator, as we all know, but he has to have personality and to have other things to go with it. All good operators would not necessarily make good technical men.

I consider it important that the management of the pulp and paper industry shall understand the necessity for the development of the technical side of our industry. I consider that most important because I feel that unless we can find some way of keeping all the latest energy of the technical men employed in this industry we are going to lag behind. That is an old saying and I want to impress it on you in this way: If every mill in this country had set a technical man at work on a definite program, in addition to fibre research work, many of the problems that we are working on to-day in the effort to reduce our cost, or improve the quality of our product would, to a very large extent have been solved. If one company is working alone, it cannot do the work so capably as if all were coordinating their work on a more or less definite program.

(Discussion to be continued, with remarks from J. S. Bates, F. J. Campbell, L. H. Shipman, W. B. Campbell, and others.)

PULP AND PAPER NEWS

Mr. T. B. Little, Montreal has returned from a visit to Hot Springs.

Sir Frederick Becker, Lady Becker, and Mr. Philpotts, Sir Frederick's solicitor, left Montreal, on March 30 for New York sailing for England on the Mauretania on April 4. Sir Frederick and his party (accompanied by Mr. A. M. Irvine) spent about a month inspecting the mills in which he is interested in Quebec and in maritime Provinces. Travelling on the railroads was by private car.

Mr. Fred Chadsey, who has been with the Dominion Paper Co. for a long time and very well known in the trade, died last week of cancer.

Mr. J. J. Herb, formerly superintendent of the Interlake Tissue Mills, and A. M. Onkels, of St. Catharines, Ont., have been to British Columbia, visiting pulp and paper mills. They spent some time in Nelson sizing up the situation with regard to establishing a plant there.

The Donnacona Paper Company has obtained permission from the Quebec government to build a large dam on the Jacques-Cartier River at the foot of Jacques-Cartier Lake.

The Brompton Pulp and Paper Co. has decided to suspend, for a time, the publication of the Brompton News, a bilingual weekly paper, edited by Mr. Stewart W. Osborne.

Directors of Spanish River Pulp and Paper Mills, Limited, announced on Saturday the declaration of the customary dividends on both the company's issues at the rate of 1 3-4 per cent on common and preferred for the current quarter payable April 15 to shareholders of April 8. This company is enjoying very good business at the present time, with plants operating close to capacity.

Mr. A. L. Dawe, assistant manager of the Canadian Export Paper Co. was the speaker at a meeting of the McGill Pulp and Paper Club on Monday.

AN ARTISTIC PAPETERIE DISPLAY

The annual spring display of papeterie by Messrs Warwick Bros. and Rutter, manufacturing stationers, King Street, West, Toronto, is now in progress and is attracting considerable attention from the stationery and paper box trades. H. C. Woods, the general manager of the company, has developed the papeterie end of the firm's business to large proportions and has been making it his special hobby for some seasons past. Each year he works out some new and artistic lines in stationery boxes which find their way to milady's boudoir after the contents have been used. In a number of lines this year the fancy papeteries have been designed so as to fit in with room decorations, many of them being finished in creton, velour and richly figured cover papers. In keeping with the exclusive and artistic finish and design of the boxes the highest grade No 1 linen and kid finish stock has been used in paper and envelopes. A particularly striking sample of several lines of stock has been treated to a gold and silver ripple edge and one beautiful series has been done in grey French parchment paper as a covering for an artistically designed box, the line also being shown in a green and red combination. A series known as the "Rosalee" in tints, with new cuts in envelope flaps and art hand bordering, is very effective and another series shows artistically designed boxes with tropical floral dressings. The whole display has been very attractively arranged in a section of the factory and has been visited by many in the paper and box-making trades. Sent by

BROWN ON ABITIBI BOARD

A. J. Brown, K.C., has been elected to the board of directors of the Abitibi Power and Paper Company. This was the most interesting development at the annual meeting of shareholders held at the head office of the company this morning. Mr. Brown fills the vacancy on the company's board created by the retirement of Shirley Ogilvie, who was a vice-president of the company.

Other business of the meeting was largely of a routine nature. The annual financial statement, which was recently reviewed in these columns, was adopted as read.

The board of directors now stands as follows:

F. H. Anson, president; Alexander Smith, vice-president; Sir Thomas Tait, George H. Kilmer, K.C., George E. Challes, W. K. George, Victor E. Mitchell, K. C., W. A. Black, and A. J. Brown, K.C.

The Abitibi mills, according to Mr. Anson, are working at capacity output presently being 500 to 550 tons per day, or 150,000 to 160,000 tons per annum. In February 12,200 tons of newsprint was manufactured, and 13,000 tons sold. The company had contracts for far enough ahead to assure a favorable average for the year.

In respect of possible expansion he pointed out that in the past few years expansion had been large, the company now being in a position to cope with readjustment conditions, with wood enough to last about 60 years and present surplus of developed water power. Shareholders would be looking for dividends and when disbursements are resumed he wished to see it done on a permanent basis.

Regarding the pulp situation, Mr. Anson said that the company is always in a position to take advantage of the pulp market whenever there is a profit in it, but that exhaustion of mills and limits without profit did not appeal to him as good business.

ST. MAURICE PAPER CO., PROFITS REDUCED

The annual financial report of the St. Maurice Paper Company, Limited, Canadian subsidiary of the Union Bag & Power Company, shows the result of an uncertain year in the paper industry. Operating profits, after all expense, amounted to $1,046,679 as compared with $2,976,636, and after deduction of $339,951 depreciation of plant and equipment, and provision for exhaustion of timber areas, net profits amounted to $706,728, down from $1,769,989 the previous year, after an additional charge of $800,000 to contingent reserve, and $43,352 interest. With addition of previous surplus, balance remained of $1,953,179, out of which dividends of $631,992 were paid. From the balance remaining an item "deduct to approximate market value at January 1, 1921, as since determined, of wood then on hand or contracted for and still on hand at December 31, 1921," $703,241. This left surplus of $617,946, reduced from $1,246,451 a year ago.

UNITED STATES NOTES

The Bryant Paper Company has been awarded $32,500 in its suit for damages against the Monarch Paper Company in a decision just handed down by United States Circuit Court Judge Jayne. The finding of Judge Jayne upholds the verdict returned last fall by the jury sitting at the trial of the case, but only to the extent of allowing the damage award. It is likely that the Monarch Paper Company, in view of other cases involved, will appeal from Judge Jayne's decision to the United States Supreme Court. There are twenty-four cases by individual property owners pending besides that of the Illinois Envelope Company for $100,000 damages. All these involve practically the same points that were brought out in the Bryant-Monarch case.

Slack business and continued falling off of orders in the open market resulted in a decision by the Forest City Paper Company to shut down its mill at Yarmouth, Maine, for an indefinite period. The plant, when operating at full capacity, employs 265 workers. Some of these who are needed in looking after the mill have been retained. To all failing to find other empoyment, an offer has been made by the company giving the opportunity to work on wood in the yard at a stated price per cord. This work consists of pealing, stripping and piling the pulpwood. Many of the employees accepted the offer.

Ginjiro Fujihara, head of the Oji Paper Company, Ltd., of Tokio, Japan, who is on an American tour in company with Yasanosuke Fukukita, purchasing manager of the company, paid a visit last week to the plant of the Bagley & Sewall Company at Watertown, N. Y. Mr. Fujihara credits much of the success of the Japanese paper-making industry to the use of Bagley and Sewall machines, which, he says, are used in nearly all the Nippon mills making newsprint paper. The Oji Paper Company, he told Bagley and Sewall officials who conducted him through their plant, has twelve of their machines in its thirteen plants.

Directors of the Rex Paper Company have chosen Merrill B. King to succeed his father, the late John F. King, as president of the corporation. Mr. King is the youngest paper mill executive in the Kalamazoo Valley district. His first work was with the King Paper Company. In 1915 he became treasurer of the Rex Paper Company, organized in that year by his father. He retained that post until his selection to head the company. Mr. King is well schooled in paper making, due to his steady contact with his father. Edwin H. Hacking, secretary, will take on the duties of teasurer in addition to his own.

Five hundred employees in the Bureau of Engraving and Printing are about to be pensioned or dismissed as the result of the diminishing demand for replacement of outstanding notes. The number of notes printed each of Federal Reserve notes following a material reduction of outstanding notes. The numbr of notes printed each day is now little more than half of what it was in day is now little more than half of what it was in 1921 when 900,000 were issued daily. At present 500,000 a day are printed. This number will shortly be reduced to but 150,000.

John S. McElwain, prominent paper manufacturer of Holyoke, Mass., and one of the oldest residents of that industrial town, celebrated his 94th birthday recently.

Directors of the International Paper Company last Wednesday declared the regular quarterly dividend of $1.50 a share on the preferred stock, payable April 15 to stock of record April 7. Recent rumors had declared that the directors might reduce or pass this dividend because the annual report for 1921, expected shortly, may make an unfavorable showing because of the company's labor troubles last year.

Extensive renovations made during the depression period on its plant at Rowlandville, Md., will enable the Felt Paper Company to add many new lines to its products. Among these will be high-grade roofings, asphalt paints, roof coatings, asbestos paper, building papers and deading felts. The company has also built a complete new roofing plant for the manufacture of prepared roofings and saturated felts.

A provision in the permanent tariff bill under which the present dye embargo with a licensing system would be continued for one year from the signing of the measure has been agreed upon by majority members of the Senate Finance Committee. American dye manufacturers had asked for an embargo for five years contending that this was necessary to protect the American industry from German competition.

SIR JOHN CRAIG EATON

The Pulp and Paper Magazine of Canada adds its voice to the chorus of general and real sorrow at the death of an outstanding citizen in the prime of a splendid business career.

Through the press we have been informed of his fine manliness, his life of service, the notable executive ability shown by him as head of one of the greatest businesses of the retail world, his genuine interest in the welfare of his employees, and his princely munificence. These are public property to his lasting credit and the public weal.

Sir John Eaton, as the head if the T. Eaton Co. Ltd., was probably the largest individual consumer of paper in the Dominion. The Eaton printing plant in Toronto is one of the show industrial plants in the city. Some idea of its size can be gathered from the fact that its pressroom houses three rotary and twelve flat bed presses. The Winnipeg plant has the same. Its catalog of between 500 and 600 pages goes into every part of the Dominion, and constitutes a large factor in the book paper market. In addition there is the paper required for the Ontario Government school readers, and a very notable consumption of wrapping papers of all weights, tissues, papeteries and sundries.

One of the terse epigrams of the founder of the T. Eaton Company was that "The customer is always right," and the sales staff were instructed to take customers claims at their face value. Such an attitude shows the courage of a great faith in humanity, one of the fundamental factors in the success of the Eatons and one that could be emulated in principle to the general betterment of business.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3. Tropical Fibers for Paper Manufacture. A. C. Heiny. Tropical Fibers Commercial Co., **Paper,** xviii, 24-25, 41, (April 27, 1921). Plants of the banana family are used for making sacks and cordages; but so far the fibers have not been used for paper making because they are not entirely freed from encrusting materials. Pulping tests carried out on the whole stalks showed excessive consumption of chemicals because the stalks contain only about 10 per cent pure pulp, the remainder being lignin, gums, resins, and a large amount of water acidulated with tannic acid which neutralizes part of the alkali of the cooking liquor. After removing water, resins, and gums, there remains about 20 per cent. of the weight in fibers, containing less than 50 per cent. lignin. A decorticating machine is described, for the treatment of this plant. Other plants than the banana can be treated by it. Tannic acid and alcohol could doubtless be obtained from the waste in quantities that would more than offset the cost of extraction of the fibers for pulp and paper making.—A. P.-C.

A-16. Notes on the Properties of Antimonial Lead. Louis J. Gurevich and Jane S. Hromatko. **Chem. Met. Eng.,** xxv, 62-63, xxv, 62-63, (July 13, 1921). In an investigation into the effects of small amounts of antimony on the physical properties of lead, the following conclusions were arrived at: melting point determinations are too indefinite to be used as a basis for calculating the composition of the lead-antimony alloys; the addition of antimony increases the hardness of the alloy; the maximum tensile strength of the lead-antimony alloy is reached with an alloy containing 10 per cent. antimony; the alloy containing 4.5 per cent. antimony gives the greatest reduction in area and is the most ductile.—A. P.-C.

B-4. By-Products of Forest Industries. Ch. Groud. **Papier,** xxiv, 250-243, (June 1921). Dead leaves have been shown to be suitable for the manufacture of paper; but this is practical only where they can be gathered mechanically. The process of preparation of "vegetable wool" from pine needles is described. It yields as by-products a water suitable for medicinal baths, an essential oil recommended in the treatment of rheumatism, gout, and indurations, a resinous soap, and a viscous, gelatinous, very bitter and very aromatic residue suitable for the manufacture of green soap. When heated, this latter product yields a diuretic or sudorific. It can also give a highly-prized carbon black. It is suggested that the residues from the preparation of chestnut and quebracho extracts be used for paper making.—A. P.-C.

B-7. Forestry for the Private Owner. Paper, xxviii, No. 8, 12; No. 9, 29; No. 10, 18; No. 11, 20; No. 12, 15; (April 27, May 4, 11, 18, 25, 1921). A discussion of the importance of the farm wood lot and of the proper methods of starting, tending, and harvesting it, and of marketing the products.—A. P.-C.

B-9. Terms on Which Canadian Pulp Wood Rights are Offered. H. Merle Cochran, American Vice-Consul, Montreal. **Paper,** xxviii, 22-23, 40, (April 27, 1921). Conditions covering the permit to cut pulp wood on certain limits to the east of Lake Winnipeg, in Manitoba Province, covering an area of approximately 718 sq. miles.—A. P.-C.

B-0. What the Pulp and Paper Industry Means to Ontario. Edward Beck. **Paper,** xxviii, 17-19, 40. (May 18, 1921). An analysis of the pulp and paper industry of Ontario and of the supplies of pulpwood of the province, together with a plea for the proper conservation of our forest resources by means of forest protection, reforestation, and prohibiting the exportation of unmanufactured wood out of the country.—A. P.-C.

C-0; G-0. A Study in the Preservation of Pulp and Pulp Wood. Paper, xxviii, 20-23, (July 20, 1921); **Pulp and Paper,** xix, 781-784, (July 28, 1921). Preliminary report on an investigation carried out by the Forest Products Lab., Madison, Wis., in co-operation with the Bur. of Plant Industry of the U. S. Dept. of Agriculture and a group of pulp and paper mills, the main purposes of which were improvement of wood storage practice and preservation of stored pulp. Prevention of decay and molding in stored pulp has been attempted by adding antiseptics to the pulp as it goes over the wet machine, or by adding the chemicals to the laps after removing from the wet machines. In selecting a suitable preservative, the following points must be taken into consideration: effectiveness as an antiseptic, poisonous properties, objectionable chemical discoloration, objectionable odors affecting the workmen, solubility in cold water, and cheapness. Judging from the antiseptic efficiency and freedom from other objectionable features sodium fluoride appears to have given the best results of those preservatives reported on. Borax follows a close second. Boric acid is equal or somewhat superior to borax; but its greater cost throws it out of competition. Sodium dinitrophenolate in 0.125 per cent. solution appears very promising, with an antiseptic efficiency equal to anything tried, but the yellowish chemical discoloration of the pulp may prove objectionable for some purposes. But this readily washes out though it leaves the pulp somewhat browner than normal. Sodium bichromate appears to be less favorable than the four above-mentioned substances as the antiseptic efficiency varied rather too widely in the tests and the tendency towards browning and possible softening of the pulp is rather marked, particularly in concentrations of 2 per cent and over. Sodium carbonate and bicarbonate, while quite efficient in 5 per cent solution, brown and soften the pulp too seriously for commercial use. Actual mill tests should be made on each of the above preservatives, applying them at the press roll wherever possible in higher concentrations than formerly so as to reduce losses in the white water.—A. P.-C.

E-0. The Manufacture of Sulphite Pulp in Europe. O. L. Berger, G. D. Jenssen Company. **Paper,** xxviii, 15-16, 30, (July 13, 1921). General outline of the methods of manufacture of sulphite pulp in Europe, contrasting American and European practice.—A. P.-C.

E-0; H-5. Bleaching of Sulphite Pulp. B. M. Petrie, Vice-Pres., Eastern Mfg. Co. **Paper,** xxviii, 20, 26, (July 6, 1921). A brief discussion of the influence of cooking acid, the method of cooking, and the washing of the pulp on its bleaching qualities, with a brief description of the method of bleaching and of making bleach liquor.—A. P.-C.

F-4. Causticizing Problems in the Sulphate Mill. N. E. Brokaw. **Paper,** 18-19, (June 15, 1921). A brief discussion of the influence of the density and strength of the liquor, quality of the lime, amount of lime required, cooking and settling of the liquor, and recovery of the soda from the sludge on the efficiency of causticizing operations.—A. P.-C.

F-0. Decay of Pulpwood and its Effect in the Soda Process. E. Sutermeister. **Pulp and Paper,** xix, 733-736, (July 14, 1921). Detailed description of small scale cooks carried out to ascertain the effect of decay on the yield of fiber and its properties. Six samples of poplar were tested, each being as nearly as possible representative of certain characteristic conditions: green wood, new sound wood, sound wood from storage (2 samples), wood from a tree which had died and become punky while standing, and the rottenest specimen which could be found in the storage pile. Four samples of birch were tested, representing: (1) green wood, (2) perfectly sound wood, (3) an intermediate grade in which decay appeared very general but which was not so punky as (4) which was the rottenest grade available. A cook was also made (under standard cooking conditions) upon a mixture of chips containing 85 per cent. sound wood and 15 per cent. of the rottenest grade, to determine, if possible, how much harm a small amount of rotten wood would do when cooked with a much larger amount of sound wood. The following results were obtained in these tests: Decay in pulpwood decreases the weight per cubic foot out of all proportion to the shrinkage in volume. Decayed wood gives a much lower yield of pulp by the soda process than does sound wood. The fiber from decayed wood is difficult or impossible to bleach to a satisfactory color. Decay so affects the fibers that they disintegrate very rapidly when beaten. The cost of fiber is increased about 45 to 80 cents per ton by each per cent of thoroughly rotten wood entering the digester.—A. P.-C.

F-0. The South as a Source of Paper. Sidney D. Wells, Forest Products Lab., Madison, Wis. **Paper,** xxviii, 22, (July 6, 1921). Tests carried out at the Forest Products Lab. have shown that various Southern pines, which are not suitable for pulping by either the sulphite or soda processes, could quite readily be treated by the sulphate process. The pulp could be satisfactorily bleached, with a bleach consumption of 18-22 per cent. (based on the weight of the pulp), in two steps, with a washing operation after each. (See also **Pulp and Paper,** xviii, 1286, F-5, K-17, Dec. 16, 1920.)—A. P.-C.

H-4. The Electrolysis of Alkali Chlorides. R. Moritz. **Chimie et Industrie,** v. 636-641, (June 1921). Notes on the operation of Type Pbf B Moritz cells, under conditions where electric current was relatively expensive, coal very expensive, salt fairly cheap, while the caustic soda could be used dilute and containing large amounts of salt. If the concentration of the liquor is allowed to fall in the cell, the voltage rises, the current and energy efficiencies drop, the quantity of water to be evaporated from the caustic soda is increased, and the loss of chlorine through the diaphragm increases. Increasing the current density increases the power consumption and also the wear on the graphite anodes. The latter may be reduced by placing the electrodes close to each other, impregnating the anodes to prevent penetration by the liquor, and completely removing sulphates from the brine and preventing the formation of chlorates. The diaphragms must be so constructed that the coefficient of filtration at the top is about the same as at the bottom, and that it remain approximately constant despite the gradual clogging up of the pores. By protecting the diaphragm with a coarser filtering surface and by maintaining a warm moist atmosphere on the side of the cathode which is not working, the life of the diaphragm is considerably prolonged.—A. P.-C.

N-5. The Use of Pulverized Fuel. Paul Frion. **Monit. Papeterie Francaise,** xlii, 327-328, 364-368, 409-411, 510-511, 578-579, 618-620, 681-684, (June 1, 15, July 1, Aug. 15, Sept. 15, Oct. 15, Nov. 1, 1921). A detailed analysis of the advantages and disadvantages of pulverized coal at the present time, based on data furnished by the U. S. and Canadian Departments of Mines, the British Ministry of Scientific and Industrial Research, and various builders of machinery for the use of pulverized coal. The advantages are (1) complete combustion with complete liberation of the total heat of the fuel; (2) possibility of using certain low grade fuels which could not be used otherwise; (3) great ease in starting up, shutting down, and controlling the fires, and great flexibility of the system The disadvantages are (1) accident hazards; (2) troubles arising from the ashes; (3) high initial cost. Accident hazards can be very greatly reduced by proper precautions. Troubles from ashes can be overcome by the proper choice and use of equipment. The greater first cost is in many cases more than compensated by the savings effected by using a lower grade of coal or consuming by less of a given grade.—A.P.-C.

O-3. Method of Softening Water. Can. patent No. 194,279. The Minerals Separation North American Corporation, New York City, N. Y., U. S. A., assignee of Edwin Edser and Stanley Tucker, both of London England, Nov. 25, 1919. The salts which produce hardness are precipitated with tri-sodium phosphate; a small proportion of a soluble soap is then added, and the mixture is agitated and aerated to form a flotation froth which carries away the precipitated salts. Claims allowed 5. - A.P.-C.

P-2 How to Interest Workers in Safety Campaigns. Al. Kroes, Employers' Mutual Insurance Co., Wausau, Wisconsin. **Paper,** xxix, 12-13, (Oct. 5, 1921). It is necessary for the safety man to talk so as to be understood by his audience. When dealing with workmen, tables of figures and statistics are ineffective; pictures and slogans should be used. - A.P.-C.

R-7 Co-operation Between Chemists and Operatives. ("Those Damn Chemists"). A.D. Wood, Champion Fiber Co., Canton, N.C. **Paper,** xxviii, 14-16, 30, (July 27, 1921). The chemist and engineer can accomplish their task properly only by obtaining the co-operation of the operatives, showing the latter that their work is for the benefit of all concerned. This requires tact and judgment. If, on the contrary, the chemist and engineer antagonize the operatives it is next to impossible for them to accomplish what they could with the help of the latter. The methods adopted towards this end at the plant of the Champion Fiber Co. at Canton, N.C., are described. - A.P.-C.

R-9. The Need of a Protective Tariff. Hon. J. Fordney, Chairman of the House Ways and Means Committee, U.S. Congress. **Pulp and Paper,** xix, 1185-1186, (Nov. 24, 1921). Brief exposition of the necessity for a protective tariff in the U.S., and of the advisability of American valuation. - A.P.-C.

R-9. The Fordney Tariff. Paper, xxviii, 9-11,18,28, (July 27, 1921). Text of the provisions relating to the pulp and paper industry. - A.P.-C.

British Trade News

(From Our London Correspondent)

London, March 21, 1922.

My recent reference to labor troubles in Scandinavia showed that millowners were experiencing difficulty in the output of their mills. This week the news reached London by wire that there is a lock-out. It was expected but only the paper mills are affected in Sweden so far. Norway is first holding the workers together.

British Wages Conference.

The conference between employers and employees on wages and hours is still sitting, with the same harmonious feeling. A number of questions have been raised by the employers side, on which the union men could not decide and ballot papers are now being prepared for circulation amongst the workers in order to ascertain their views. If these ballot papers are against the millowners there might be a deadlock.

Paper Makers' Dinner

This week the annual meeting of the British Papermakers Association will be held. When the business is over the dinner will follow and some important speakers are announced to appear. Mr. Leonard Tod, President, will preside.

Fire.

A fire broke out in the beater-house of the Bonnington Paper Mill, Leith, a few days ago and damage to the extent of £5,000 was done to machinery and raw materials. The mill is owned by James Henderson, Ltd., and at one period of the fire it looked as if the whole of the premises would be involved. Thanks to a good squad of fire-fighters the outbreak was confined to one building.

The Pulp Market

Conditions prevailing in the pulp market are still not up to the expectations of sellers, who say that here and there enquiries are received for easy bleaching sulphite, but in other sections, including groundwood, business is on the weak side. Swedish millowners report that they are restricting output and Norwegians have the same story to tell as the British sellers.

The Board of Trade figures may enlighten us a little of what was being done during February. The total imports received—all kinds of pulp—reached only 20,169 tons, compared with 48,196 tons in January, and 32,609 tons in February 1921. And a noticeable feature is that no groundwood was shipped to England in February, from Canada.

Details of the imports are as follows:—Chemical Bleach sulphite (dry) 730 tons (Jan. 2.252 tons); unbleached (dry), 2,372 tons (Jan. 21, 302 tons); chemical wet, 89 tons (Jan. 965 tons); Groundwood, (dry), 287 tons (Jan. nil); groundwood (moist) 16,689 tons (January, 28,153 tons). The countries of supply were:

Bleached Sulphite (dry)—From Sweden 160 tons; Norway 370 tons; Germany, 75 tons; Canada and other countries 125 tons. Total 730 tons as against 1,555 tons in Februry 1921.

Unbleached Chemical pulp (dry)—From Finland, 50 tons; Sweden, 402 tons; Norway, 1,888 tons; Germany, 16 tons; Canada and other countries, 16 tons. Total: 2,372 tons, as against 6,806 tons in Feb. 1921.

Groundwood (wet)—From Sweden, 2,670 tons; Norway, 14,014 tons; Canada nil (90 tons in Feb. 1921); other countries 5 tons. Total: 16,689 tons, as against 23,189 tons in Feb. 1921.

It will be seen from the fore-going figures that the pulp market is not over the depression yet, notwithstanding all the optimistic views we read and hear about.

Canadian Pulp Arrives.

The "Domira" reached Aberdeen this week after experiencing a very rough voyage from Halifax which she left on the 18th February. The ship had on board 4,000 tons of pulp—1,800 tons going to the Donside Paper Mill—and the rough seas in mid-ocean were so great that part of the deck cargo was washed overboard. This is a very rare occurrence with pulp steamers plying between Canada and United Kingdom ports.

British Paper Exports Down.

The exports of British paper, all kinds, boards, etc., only reached 119,201 cwts in Feb., compared with 146,915 cwts in January and 130,870 cwts in Feb. 1921. It is certainly not a sign of progress.

Packing and wrapping feel from 25,091 cwts in Jan. last to 16,572 cwts in Feb. But January had 31 days and Feb 28 and the shipments on Feb 1921 were 11,188 cwts. Newsprint and fine printings were exported to the extent of 56,351 cwts in Feb., and 72,923 cwts in January and it is noticeable in the returns that Australian trade, owing to the preferential tariff for British paper, jumped to 22,441 cwts, compared with 19,642 cwts in Feb. 1921—a busy time—and 28,123 cwts in January last. The same may be said with regard to packings and wrappings. But Canada is buying less from the British exporters, so is the Straits Settlements, India, and South Africa. France bought 5,421 cwts of newsprint in Feb. compared with 3,144 cwts in January.

British Imports.

No paper supplies were received from Canada and Newfoundland in Feb. except wrappings from Canada. But for the two months of this year no record is given of newsprint from Canada.

The total imports of all kinds of paper, including boards etc., reached 408,793 cwts, compared with 472,572 cwts in Feb. 1921 and 146,915 cwts in January last. Sweden shipped in Feb. 40,322 cwts of newsprint; Norway 27,187 cwts; Germany 9,931 cwts.

Turning to wrappings, including tissue paper, the total imports reached 155,167 cwts., compared with 91,765 cwts in Feb. 1921 and 25,091 cwts in January last. These figures are worth comparing with the British export trade of 16,572 cwts in Feb. It will be thus seen that the British market is no small one for wrappings and Canada enjoys a fair share, the shipments from all countries being:—From Finland 6,386 cwts; Sweden, 35,640 cwts; Norway, 45,253 cwts; Germany, 30,50 cwts; Belgium, 8,526 cwts; Canada, 9,293 cwts; other countries 19,569 cwts.

Teaching the Young "How to Fly"

The pupils attending the classes and schools for papermaking instruction, including buying and selling, receive a thorough grounding from the speciallists they are under and now it has become part of the curriculum to pay a visit to paper mills. By this means the students see for themselves the handling of the raw materials, the running machinery, and the store and cutting rooms; otherwise, paper made from start to finish. In every case the British millowners welcome the students and their teachers, and in this way they are trying to produces buyers and sellers from the rising generation to participate in one of the hardest markets in the world for competition.

THE GERMAN NEWS PRINT MARKET

(Special Correspondence.)

In the course of an interview with the able and energetic manager of a large wholesale manufacturing house the writer obtained Herr Hitzeroth's views on the situation. They were written down to avoid mistakes, which it would be very easy to make in the present condition of business. The gist of the various matters discussed may be thus expressed in English.

"The sale of news print for the requirements of the German press in Germany proper is in the hands of the Association of German News Print Mills, G.m.b.H. Berlin, and the United Independent News Print Mills; the two comprising all German mills producting news print paper. They are linked together in one corporation.

These Associations from time to time fix by agreement among their members the price of news print required for domestic use, and, at the same time, orders for the paper are distributed among the mills chiefly concerned and situated as nearly as possible to the consumer's place of business.

In the summer of 1921 the price of new print in reels and in sheets (format) amounted to about 350 marks per 100 kilos (220 lb.) delivered free to the receiver's station. Since dry weather ruled in August 1921, and the rivers consequently yielded an extremely small supply of water, the groundwood mills were therefore not in a position to maintain a regular and steady production, and fulfill their obligations to deliver woodpulp. The stocks on hand were soon used up, so that in a very short time a lack of groundwood made itself noticeable, which again produced a rise of prices for woodpulp. As a consequence, the news print mills on their own side were unable to produce except in very small quantity, while the costs of wages, of operation of the mills rose again to similar heights. Towards the end of the year there was a shortage of coal, enormous increases of the cost of coal, as well as demands of the workmen in the mills for higher wages, which, with the fixed prices of the time, made a successful result impossible for the mills. Since the cellulose mills produced under the same unfavorable conditions the price of raw cellulose rose 100 per cent. Also the freight rates as a whole were increased 130 per cent to diminish the railway deficit.

These facts necessitate that news print in March 1922 will be increased in price to 830 mk. per 100 kilos, that the f.o.b. costs, receiving station, will be raised and that we must be prepared to reckon with a price of 1000 marks per 100 kilos. (about 1.5 cents per lb.)

Although a considerable overproduction of news print was manifest in Germany during the summer of 1921 paper which could be sold at an advantageous price in foreign countries, the Export Bureau for the paper industry in Berlin, which exercises control over all export business, and the distribution of export business saw itself compelled by unforseen trade dislocations, by the publishers' lack of materials, and the difficulties of the newspaper publishers who suffered from a lack of paper to reduce the number of licenses, already alloted, to 10 per cent of the paper previously passed for export. Germany is consequently not in the position to export news print in large quantities. Since the paper mills, during present conditions must ask for a period of three months for delivery, and, owing to the non-clarified situation are unable to make contracts at fixed prices for orders received, it is almost impossible for the exporter to do business with his foreign customers on a basis of price "remaining free," that is, the daily price on delivery for the foreign buyer can only buy and only will buy, when he definitely knows what price he must pay for the goods ordered. For these reasons all exporters think the time has passed, when the business position will become stable again, and business with their foreign friends will take a smooth course of development.

Invoices in Foreign Money

While Germans deplore the state of their own exchange they apply the scourge to countries not much better off. The rule just proclaimed by the export commission provides in sales of cotton that:

1. The exchange of goods with countries with a high rate of exchange—cotton goods—must be invoiced in money with a high valuta;
2. The export offers of the German Economic Bureau for cotton can only be issued when sales to countries with a high rate of exchange are invoiced in the money of the countries concerned. Countries, to which rule does not apply or countries with a low rate of exchange, are Portugal, Jugo-Slavia, Finland, Rumania, Austria, Hungary, Poland, Russia.

Die Textil-Woche, March 10, 1922.

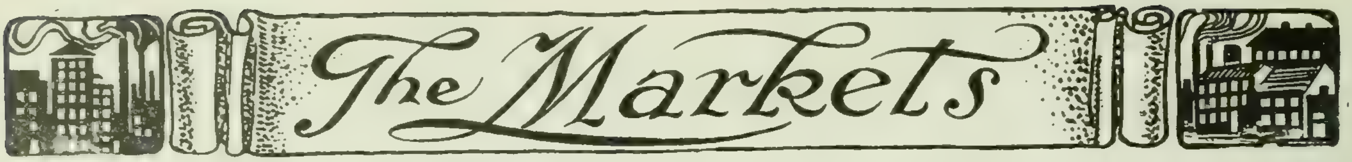
WOODLANDS SECTION CONVENTION PROGRAM

New York, Apr. 1.—Problems of reforestation by paper companies, the damage being done in the spruce forests by the bud worm, the waste in converting pulp wood into pulp are only a few of the subjects yhich are scheduled for discussion at the convention of the Woodlands Section of the American Paper Pulp Association on Tuesday, April 11, during the annual convention of the paper industry in New York City.

P. T. Coolidge of Bangor, Me., and Ellwood Wilson of the Laurentide Company of Quebec, under the head of "Successful Reforestation for Pulp and Paper Companies" will discuss such problems as conditions favoring reforestation, natural vs. artificial reforestation and methods used, planting as a safe investment, fire prevention, desirable species, methods and costs of planting, and the great problem of whether the present timber supply warrants extensive reforestation.

E. W. Kiefer of the Port Huron Sulphite and Paper Company will discuss under the subject of "Pulps and Pulpwood," the number of pounds of pulp paid for in a cord of wood, how many pounds per cord go into the grinders or digesters, and the percentages of bark, water, and waste in the wood.

Insect damage will be discussed by Dr. Hopkins of the Federal Bureau of Entomology, and W. R. Hastings, State Forester of Vermont. Other subjects are "Labor Saving Machinery for Woods Operations," George H. Anson, Abitibi Power and Paper Company; "Company Woods Operations vs. Contracted Woods Operations," D. A. Crocker, Eastern Manufacturing Company, Bangor, Me.; "Pulpwood Contracts; Percentages to Contractors when Wood is Peeled, Sawed and Yarded to Haul," J. O. Lynch, Lincoln Pulpwood Company; "What Can a Forester Do for a Paper Company?" Julian Rothery, New York City; "Rossing at the Mills vs. Rossing in the Woods," H. B. Morse, Orono Pulp and Paper Company; "Advisability of Cutting Pulp Wood to a 3 inch Diameter Limit," G. B. Wells, John Schroeder Lumber Company; "Intensive Local Fire Protection," E. S. Holloway and C. W. Hurtubis, Hammermill Paper Company, "A Coast System for Logging Operations," G. A. Ware, News Print Service Bureau.



The Markets

CANADIAN TRADE CONDITIONS

Montreal, April 4.—The outstanding feature of the paper market during the first quarter of the year has been the revival on the demand for newsprint. Customers who had been attracted by the lower quotations of European firms, particularly those in Germany, found that the supplies were not only uncertain, but that the goods were not of a uniform and reliable character. The supposed cheapness, in fact, proved to be illusory. Hence consumers have returned to Canadian mills, save of a positive supply and of reliable quality. The demand is growing, and according to a statement made by Mr. A. L. Dawe, of the Canadian Export Paper Company, who last week returned from a month's trip to the United States, there is evidence that the consumption of newsprint is on the up-grade. All the mills represented by the Company are running to capacity, and the mill of the St. Maurice Paper Company is also fully employed.

Book and fine papers are selling fairly well, and are maintaining the improvement which has marked the first quarter of the year. Wrappings too are in better request. The board department has proved disappointing, with the immediate outlook none too promising. The demand from the box-makers is not only slow, but board manufacturers are faced with serious competition by U. S. makers; this, however, may diminish as U. S. mills are now more fully engaged with domestic demand. Considerable quantities of boards are being dumped here at prices which our manufacturers are not able to meet and stay in business. The felt section is in a more or less stagnant condition, due to the fact that the much-heralded building boom has not yet arrived. Besides this, jobbers in this line are not prepared to carry extensive stock at the moment, and are inclued to adopt a policy of buying as occasion demands.

Rags are scarce, with indications that imports from Europe will be on the same basis as last year. Waste paper is in good demand.

The pulp market shows of a little more activity in sulphite, but with groundwood still stagnant. Naturally producers of chemical pulp are interested in the news that the Senate Finance Committee favor a 5 per cent ad valorem duty on chemical pulp, which is evidently aimed at Canadian pulps. While anxious to secure our natural resources—including wood from Crown lands—there is a desire to limit the imports of the Canadian manufactured article. The proposal is apparently in line with the U. S. policy to put up a more formidable tariff barrier against foreign competition, in every line of commerce.

According to Washington advices, the Customs authorities have found, after investigation, that there is no ground for the allegations that Canadian pulp was being shipped in violation of the Anti-dumping law.

NEW YORK MARKETS

New York, April 1.—(Special Correspondence).—Business in paper in the New York market continues along rather set lines. There is a fairly good retail demand of routine character, and most grades of paper are finding a more or less ready sale in small amounts, but consumers are still noticeably limiting the scope of their buying operations. No one seems willing to absorb other than supplies actually needed to cover direct requirements, and with both large and small buyers sticking firmly to this policy, it is to be expected that paper manufacturers are not procuring sufficient business to keep their plants running at anything like full capacity.

Prices on most kinds of paper are holding comparatively steady. There is not enough demand to have strengthening influence; on the other hand, prices have gradually receded until they are now on levels where there seems little possibility of further decline. Consumers themselves freely acknowledge that paper prices are low, and that there is small likelihood of them going lower; nevertheless this belief on the part of paper users does not induce them to lay in supplies because of the decided aversion to stocking up. It is a fact that in numerous cases paper mills are today accepting orders at prices which not only fail to net them a profit but which represent a considerable loss in producing the paper. This, most assuredly, is an unhealthy condition, and one which cannot exist indefinitely, but the mere fact that it does exist and that it fails to attract any more demand than would undoubtedly be felt were prices on a more profitable level for manufacturers goes to prove that it is not matters of price which keep consumers from buying in larger volume at present.

From all accounts, the movement of newsprint into consuming channels is holding up at a fairly steady pace. Newspapers in New York are printing large issues at present, which is the usual occurrence at this time of the year just prior to Easter and the spring shopping season, and it is stated that the same holds true for the remainder of the States.

Quotations on newsprint are steady at a contract basis of 3.50 cents per pound f.o.b. mills for standard news in rolls, and with transient buyers asked an eighth to a quarter of a cent per pound above this figure. Practically all talk of a further decline in print paper prices has ceased, and it appears that there is small likelihood of any additional cut in prices for some time to come.

Demand for book paper is showing more life although consumers continue to limit the tonnage of their orders. Manufacturers report receiving a large number of individual orders yet say that the aggregate volume of business does not begin to give them enough to do to keep mills operating full, while prices on book papers are in far from a satisfactory position. Competition has forced quotations down to a level where it can almost be said that the bulk of book paper now being produced is marketed at a loss to manufacturers. Machine finished book is quoted at around 6 cents per pound f.o.b. New York, with purchases down to 5.75 cents recorded now and then, while super book is quoted at around 6.50 cents, and coated book at from 8.25 cents upward.

A little broader demand is reported for wrapping paper and prices evince a stiffening tendency though imported supplies of Swedish kraft paper continue to have a bad influence on the market. Tissues are steady in price and are moving in a routine way. Fine papers are in slow demand, everything considered, notwithstanding that mills are securing many orders for small lots.

The box board situation looks more favorable day by day. The outlook for April is very encouraging, it being reported that mills all over the country making various kinds of board are almost completely booked up with orders for this month. The discouraging part of this is, however, that orders have been taken at low prices—prices which afford manufacturers little or no profit in running their plants. In other words, it is well nigh impossible for board mills to produce plain chip board under prevailing circumstances at $35 a ton, yet this is the price basis at which April business has been booked. Figuring the cost of old waste paper at the minimum of $15 per ton of board, shrinkage included, and the conversion cost at the very conservative estimate of $20 a ton, where does the board producer stand to realize a profit, especially since the $35 a ton price on board is on a delivered consuming point basis?

GROUNDWOOD—Mechanical pulp is in a rather stationary market position. There is not enough demand to have worthwhile strengthening influence on values; on the other hand, there is sufficient buying to firmly maintain prices, while unsold stocks do not appear to be any too large. Domestic grinders quote around $32 a ton f.o.b. producing plants for prime spruce ground wood freshly ground for prompt shipment, with delivered consuming mill prices generally figuring out, with freight, at between $40 and $42 a ton. Several schooners loaded with ground wood from Nova Scotia have arrived at New York this week, and this pulp is reported bringing $34 to $35 a ton ex the dock at this port.

CHEMICAL PULP.—Nothing new has been learned relative to the proposal of the United States Congress to place an import duty on chemical wood pulp. The trade is still waiting for the new tariff bill to be reported out from the Senate Finance Committee to see what provision has been made for pulp, and in the meantime the subject is being given its due consideration in discussions among trade factors. There are those who express the opinion that should an import tax be imposed on pulp, Canada might seek to retaliate by placing an embargo on the shipment of pulp wood from the Dominion to the United States, in which event the duty on pulp would have a more or less boomerang effect on the domestic pulp producer in this country, many of whom procure the bulk of their timber supplies from Canada. Others assert that if a duty is placed on pulp it necessarily follows that newsprint will have to be taxed, which would unquestionably raise a loud howl from newspaper publishers.

There is little change in the chemical pulp market. Sulphite is meeting with a moderate sale, although many consumers are looking to imported supplies to fill their wants because of the relatively lower prices named on foreign pulp than on the domestic product. Quotations are on about last reported levels, with the market lacking a definite trend unless it be in a downward direction.

RAGS.—Buyers of rags are operating on a most conservative scale. Prices on most grades, and particularly the low grades, however, have receeded to levels where little room is left for further decline, so that quotations are holding at nominal ranges. Roofing rags have sold in New York this week at 90 cents a hundred pounds for No. 1 packing, and even less than 80 cents for No. 2 packing. Old whites are easy in price and are little wanted by mills, while thirds and blues are almost entirely neglected. New cuttings, with the exception of several descriptions including No. 1 white shirt cuttings, are moving in but small quantities and at sagging prices.

PAPER STOCK.—Several grades of old paper are in moderate demand though buyers refuse to go beyond certain price limits when placing orders. No. 1 soft white shavings are bringing 3.10 to 3.20 cents a pound f.o.b. New York and seem to be moving freely; heavy magazines are selling at around 1.40 cents New York, white news cuttings at 1.65 cents are finding a fair outlet, while board mills are absorbing rather good amounts of No. 1 mixed paper at 45 to 50 cents a hundred pounds. Old kraft paper is largely neglected by consumers, and offerings of No. 1 packing by dealers at 1.75 cents a pound f.o.b. New York have been noted. Hard white shavings of No. 1 quality are quoted at 3.75 cents a pound, and flat folded newspapers at 55.

OLD ROPE AND BAGGING.—Felt paper mills appear to be showing more interest in old bagging than in rag stock, which is presumably due to efforts on their part to produce felt with as cheap raw material as can be procured. No. 1 scrap bagging is selling at one cent a pound f.o.b. New York, and roofing bagging at 70 to 75 cents a hundred pounds. Old rope is moving in routine fashion to regular consumers only at prices ranging around 4.25 cents per pound for domestic manila rope in No. 1 condition. Old strings are in fair demand and are fetching an average price of 90 cents a hundred pounds at dealers' shipping points.

Do your work cheerfully, heartily and effectually, and be ever prepared for the place further up.

Scandinavian American Trading Co.

50 E. 42nd STREET TELEPHONES 8311 8312 8313 MURRAY HILL **NEW YORK**

We buy all kinds of Canadian **WOOD PULP** AT TOP PRICES. Write us and be Convinced.

DOWNINGTOWN MANUFACTURING COMPANY'S LONG RECORD.

Since 1880, the Downingtown Manufacturing Company at East Downingtown, Pa., has been making equipment for the pulp and paper industry. From very small beginnings the company has grown and developed, under the able guidance and due largely to the engineering ability of its president Mr. Guyon Miller, to one of the most important concerns in this line.

The Downingtown Manufacturing Co., is equipped to make pretty nearly anything required in a paper mill but perhaps their best known products are beaters, paper machines and pumps. One naturally associates the name of this company particularly with large-capacity cylinder machines of which they have built a great number, although Fourdrinier and special machines of great excellence have been turned out by their plant.

The spirit of progress in a company is unmistakably shown by the desire and ability to develop a new and improved product. This is exemplified in the design and construction of the Miller Duplex Beater which is equipped with two bed plates, one in the usual place below the roll and the other suspended above the roll in such a way that the lighter bar pulls the upper plate twice the distance moved at any time by the roll spindle, thus maintaining the same beating conditions between the roll and each bed plate. The circulation in this beater is in the vertical plane, that is, the stock passes under the roll in one direction and over the roll on its return. This saves floor space and requires that every particle of stock pass the roll the same number of times, thus getting uniform beating treatment.

Another special product of the Downingtown Company, is their collapsible reel which keeps the paper wound at every revolution of a constant length so that by cutting through the layers when the reel is full, the operator has a bundle of sheets each as long as the other. This machine finds special use in the tissue industry.

The Downingtown plant is one of the best equipped in the country for the production of paper mill machinery and improvements have been constantly made in their own plant as well as in their products.

PENNSYLVANIA (PENN'S WOODS) AND THE PAPER INDUSTRY.

State College, Pa., March 13. — "Despite the fact that Pennsylvania's forest areas have been stripped of their forests until the hills of Cental Pennsylvania are one of America's most desolate regions, the paper industry, which is dependent absolutely on the forests for its raw material, is still strong in Pennsylvania," said Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Association, to the students of the forestry department of Penn State College this evening. It was a home-coming for Dr. Baker, for he was formerly in charge of the forestry department, before going to New York State State's College of Forestry, which he later left because of the realization by the paper industry that it must devote its attention to the forestry problem.

"Pennsylvania," said Dr. Baker, "now ranks fourth in importance in the list of states converting wood into pulp, but its mills have gone into the making of fine papers and specialties, as the disappearance of the forests has driven the newsprint mills north and into Canada. Its importations of foreign spruce alone totaled 122,000 cords in 1920, or more than one-fourth of its entire wood consumption.

"It will not be difficult to demonstrate to the paper manufacturer that he can afford to grow trees for pulp wood when he is paying from $15 to $20 per cord for peeled wood. It is my belief that we are passing out of the sentimental stage in forestry, and that in the next five years we are going to see the beginning of a real economic development in forestry. That is, the time has come when it is going to pay in dollars and cents to grow trees. When foresters can demonstrate to the paper manufacturer that he can afford to grow pulp wood, we are going to see the same sensible turning to forestry that we have seen in the turn to better banking methods and better methods of manufacture."

PACIFIC OCEAN RATES REDUCED.

At a meeting of shipping interests held in Seattle, late in January, it was decided to cut the trans-Pacific rate on pulp from $10 to $9 a ton. The cut was made for the specific purpose of helping British Columbia pulp interests hold the Japanese market against the Scandinavians, who have been cutting into it greatly in the past few months with cargoes sent by way of the Mediterranean and the Suez Canal. The market for pulp in the Orient has expanded by leaps and bounds during the past few years, and, until the depression in Europe drove the Scandinavians to look for markets further afield, it gave promise of being British Columbia's own preserve. With a more favorable freight rate, the pulp interests of the province believe they can recapture the trade and hold it.

NEW PULVERISED FUEL BULLETIN.

A new bulletin on the Quigley Fuel Systems, comprising methods of preparing, transporting, and burning of pulverized fuels has just been published by the Hardinge Company, 120 Broadway, New York.

This bulletin is known as No. 12 and treats the subject of pulverized fuels in an extensive manner. One of its distinguishing features is the fact that emphasis is laid upon the methods employed to properly prepare and burn the powdered coal, rather than occupying most of the space discussing the pulverizer.

This bulletin comes at a very opportune moment, for the burning of pulverized fuel has reached the stage in its development where its success is assured. It is now being specified by the largest power and heat engineers in the country as a solution to many problems involving the generation of heat.

Aside from complete plant layouts, what they term as a "Unit Milling Plant" is described. The System comprises a method of pulverizing and transporting the coal to one or more furnaces in the same locality, at the same time securing positive regulation and continuous operation over extended periods.

This catalog will undoubtedly be very useful to the engineer designing power plants or furnaces requiring considerable quantities of heat, as facts and figures are given which will aid him in his work. At the same time, it is written in a way that will interest the non-technical person who is seeking a general knowledge of this most interesting and talked-of subject.

W. Robinson, Minister of Lands and Mines, estimates that the spruce bud worm had ruined standing timber on which New Brunswick's stumpage dues would have been $19,750,000.

Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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:-: EDITORIAL :-:

INDEPENDENCE OF CANADIAN LABOR

There has for some time been developing a feeling that Canadian labor organized in International Unions has not been a sufficiently determining factor in the formulation of policy. If one could, without criticism, consider the whole continent as having sufficiently identical conditions to warrant uniform and identical treatment, then there would be less justification for complaint if a general policy were dictated from a central bureau. The fact cannot be overlooked however, that at the present time conditions are often distinctly different not only between Canada and the United States but even between communities in the same country. Proportionate representation in the councils of an organization does not meet the need for the balance of authority which should obtain as respects differences in geographic, economic and political conditions. If one looks only at English speaking countries today, it is obvious that uniform terms cannot possibly be justified. The differences in the prosperity of business require quite different attitudes with regard to both management and labor. In England, for instance, where practically the whole industry is working but a fraction of the time and some mills shut down completely, it is impossible to provide either the amount of employment or the rate of wages or pay the price for materials that would be possible in Canada or the United States. Even comparing these two countries we find a vast difference in the amount of business done by different branches of the industry. Newsprint mills in Canada are fortunately well employed and those in the United States are fairly well engaged. Book paper mills in Canada are fairly busy while those in the United States are very slack. On the other hand, board mills in the United States are well supplied with orders while Canadian mills are anxiously looking for business.

Somewhat analogous discrepancies could be cited for every industry represented by an International Union and, as we have said, in addition to the business situation, there are to be considered several other factors which strongly indicate the inadvisability of dictation of general policy by an executive which is partly or wholly non-resident.

It was evidently with such thoughts in mind that the Espanola (Ont.) local has started a campaign for the purpose of organizing a Canadian district council of the International Brotherhood of Paper Makers. In his monthly letter to the Paper Makers Journal, Mr. Frank McLeod, 3rd Vice President of the Brotherhood quotes a letter which was sent to the officers and members of all Canadian locals. He adds that very favorable replies to the communication have been received and that the committee would appreciate any improvements on the plan proposed. We have not been advised of any further developments but feel sure that the Canadian members of the Brotherhood are entirely capable of developing an autonomous Canadian division within the Brotherhood and conducting the affairs of the Canadian members while at the same time remaining loyal and helpful members of the International organization. The letter is as follows:

To the Officers and Members of all
Canadian Locals:

Greetings.—At our last regular meeting the subject matter of a Canadian district council was discussed at some length and finally decided to communicate with the Canadian Locals, with the object of forming a district council here in Canada for the express purpose of looking after our own interest with regards to wages, conditions, etc.

We believe the time has arrived for us to take matters such as the above mentioned in our own hands before drafting new agreements for the coming year, as we are of the opinion that we could greatly better our interests by looking after such matters ourselves.

We want it "distinctly" understood, that the subject-matter contained in this letter does not mean a secession movement, and will in no way affect our affiliation with the I. B. of P. M. only that we will be a district council under Canadian jurisdiction.

We feel it unfair and unjust to have our wages arbitrated by a board dealing with wages in the United States as well as in Canada, as the cost of living is much higher in Canada, and the purchasing power of our dollar as compared with the purchasing power of the American dollar, was not taken into consideration in the past, and don't expect that it will be in the future under the present system.

And further, as the paper industry expands its trend toward the Dominion of Canada, and as nearly ninety per cent of the big fast running news machines are at present operating in Canada, we feel that the opportunity is at hand, whereby the Canadian Locals should combine under a district council in order that we would be better able to deal with the Canadian manufacturers in the future.

As you know that, under the present system, we have no defense of any kind with the exception of numerical strength, and it is our aim and opinion that under a council system, a large defense fund could be built up within a short time, for the sole use of Canadian Locals, that might become involved in a strike or lock out.

Should your Local be interested in forming a district council, we are of the opinion that as our International Convention will be held some time in February, we think it advisable to hold a conference at some central point on or about January 22nd, we would suggest North Bay as we feel that by holding a conference of the Canadian Locals before the various delegates from the Canadian Locals to the convention in February would be more enlightened on the subject, and in a better position to protect the measure should it come up at the convention, as we feel that it will.

We remain fraternally yours,
H. MATIN,
L. N. CASELMAN,
P. FALER,
R. H. SAWYER,
Committee.

We feel that this movement is to be heartily commended, not only on Canadian grounds but as respects cooperation and growth of friendly feelings between the two countries. There is nothing so sure to estrange a people as to feel that they are being dictated to by an outsider, and it is far better to have friendly, co-ordinate, co-operating sections of a big movement than to have an unfriendly division because of feelings of injustice which may develop. We feel that organized labor is at the cross roads and that from now on the successful union will be the one organized for the mutual benefit of members and cooperation with the employers for the benefit of the public.

THE SERVICE OF THE PAPER CLUB

There is the club that drives and the club that leads. The Paper Club of Montreal, was organized distinctly for the latter purpose. It has now been organized about year and will hold its first annual meeting next week. The club has met once a month for luncheon which was followed by speakers who discussed problems of fundamental interest to the club members. These occasions have furnished opportunities for the salesmen in the Montreal district to become acquainted with one another. The attendance has been fairly regular but a number of paper dealers have been conspicuous by their absence. The membership is not confined to paper merchants but includes all who are interested in the merchandise of paper and paper products both manufacturers and distributors.

Apparently the heads of these firms are missing an excellent opportunity to encourage and to inspire confidence and enthusiasm in the paper business which they could do to a marked degree by attendance at these monthly luncheons. Not only do they fail to attend the meetings themselves, but do not sufficiently encourage membership and attendance on the part of their salesmen. Many of these same merchants and manufacturers are enthusiastic supporters of the Pulp and Paper Association and the Canadian Paper Trade Association. The unqualified success of these associations during recent months of uncertainty and difficulty should argue for the fullest possible support of the Paper Club. The club does not require any financial support from them but a little encouragement and an occasional talk would not only inspire greater confidence on the part of their own salesmen in their own business, but would help to develop an esprit de corps among the clan that would be a big boost to the consumption of paper in this district. It would also be the means of enabling the distributors of paper to give better service to their customers through a better knowledge of their product. Then, too, as Mr. Todd so well expressed it in his talk at the last meeting of the club, there would be the friendly disposition of one towards the other that would bring about better relations also between the trade and the users of paper.

We not only believe that the Montreal Paper Club should be well supported by the mills and the merchants interested in this district, but that every centre of fair size should have its own paper club and it would be our humble suggestion that these clubs be tied together by constituting members in them as an associate membership in the Paper Trade Association.

COBWEBS

At the time Lombard and Company was established, only handmade paper was used for the majority of purposes. This was in 1827. In those days there was published in Boston a paper called the News Letter which was one of the first newspapers and filled a very important position in the life of the American Colonies and in the early days of the new nation. An almost exact counterpart of the Boston News Letter is the Lombard News Letter, the first number of which we have just received. This is printed in the same style and also on handmade paper but of a better quality than the specimen of the Boston News Letter containing important news of the time which we have seen at Washington's old headquarters at Valley Forge. The Lombard News Letter has some interesting little items on general news, some short stories with a decided point, and of course, a little information about the company and their pulp stones which they have manufactured since 1867.

We wish to acknowledge the receipt of catalog G 307 on the subject of the Bird Pulp Thickener made in Canada by the Canadian Ingersoll Rand Company, also a little book from the same source entitled Critical Points in Paper Making.

I. W. KOLLAM WEDS

Mr. I. W. Kollam, of Montreal, who is on the directorate of several pulp and paper concerns and a prominent member of Royal Securities, Inc., was married on April 5. The bride is Miss Dorothy Johnston of St. Louis, where the wedding took place.

Manufacture of Jute Board*

By JOHN PFISTER.

There seems to be a difference of opinion in the making of Jute Board. Most superintendents have had experience with test and peeling of liners. In our last meeting at Menasha, Mr. Henry Bert advised keeping the container clippings out of the filler of the jute liner. I do not agree with Mr. Bert, and I would advise the mills to have the Box Factories keep these clippings separate for you, bale them, and use as much as you can afford to use in every filler beater. By this I mean, try to divide it into proportion as to your accumulation of a certain number of hundred pounds per beater. This stock has been ground up is easy to beat up again, and it will not only give you an even test, and a good test, but will help you decrease your kraft and such other high-priced fibres as you may be using to obtain test.

Examining the different containers manufactured by the various mills, I found a good many of them have a peeling liner. In other words, you can get hold of the liner at some point of the box, and the liner will hang together until it peels almost all the way around the box. This seems to be quite serious to the customer that purchases that box. He expects to use the container, not only for packing, but for advertising purposes, and we have to give them a board that will not peel.

Some of the mills are running two liners, running the liner on two molds. Running the liner on two molds, it is hardly possible to use less than .006 liner to make a good job of it. It does not seem possible that this can be done at the cost of stock to-day, and I have experimented quite a bit with trying to prevent the peeling of the liner.

Thickness of Liner.

My experience has been to get the liner as short as possible, then running it on the first mold, or in other words, running the liner on the bottom of the sheet asit passes through the wet end of the machine, each couch will have the opportunity of knitting the liner tighter to the filler. My experience also has been that .004⅛ of liner has been sufficient on any piece of container we have made.

Automatic Machines.

We have the old time creasers in our Box Factory, and also two automatic machines. The automatic machines have a tendency to abuse the container board more than the old time creaser, but .004½ of liner put on the sheet in the right way, will pass through this automatic double creasing and cutting machine without a crack and make an excellent bender.

The customer desires a clean, smooth box; in order to secure this, it is advisable to run a cheap calender color, which will help cover up some of the dirty stock in the liner, and give you a better looking sheet of board.

We have variable speed motors that drive our paper machines and constant speed motors that drive the jordans and beaters independently. Our motors are fitted with the necessary instruments so that at all times we can obtain the horse-power required to do a certain work, and we have obtained some interesting data as to the horse-power required to run the different machines, which I will submit later.

It is estimated that 90 percent of the paper mills are operating by steam engine and you will know that it is hard to obtain the horse-power necessary to operate the machine from your high-speed engine, such as Chandler and Taylor, and the different types which are most popular in operating paper machines.

In order to obtain the horse-power from these machines, it will be necessary to get a steam indicator and indicate these engines, at the various calipers and speeds which you expect to make. In fact I might add that it is almost impossible to indicate one of these high-speed engines and get a correct reading. This is easier to do with Corliss engine type, and you may get a fair reading from your engine which operates your beater room, but would find it hard to get a separate beater reading. The same thing applies to getting separate desired readings from the different sized jordans.

The data of horse-powers which I am submitting were accumulated in one day from the various speeds and calipers we were working on. The first figures of horse-power were taken from a Beloit four deck machine, which will trim 135 inches. The 135-inch machine has two calender stacks eighty dryers, three heavy presses and six molds. The same machine we can add about 18 to 25 horse-power addition to these figures when running on rolls. The various horse-powers just mentioned were secured while runing sheets. The entire machine consumed horse-power at the motor as follows:

H. P. Required.

Machine running 88 ft. per minute, 68 H.P.; machine running 91 ft. per minute, 71 H.P.; machine running 93 ft. per minute, 74 H.P.; machine running 98 ft. per minute, 78 H.P.; machine runing 118 ft. per minute, 126 H.P.

On another 112-inch machine, two calender stacks, seventy dryers, three large presses, five molds, as follows:

Machine running 80 ft. per minute, 80 H.P.; machine running 93 ft. per minute, 87 H.P.; machine running 112 ft. per minute, 102 H.P.; machine running 120 ft. per minute, 116 H.P.

On the 112-inch machine we had three 37-inch rolls at 93 feet per minute, and consuming 85 H.P. while the rolls were about 12 inches in diameter or just starting. As the rolls increased in size, the horse-power also increased, and the horse-power also increased, and the reading we obtained while the rolls were 46 inches in diameter was 105 H.P.

In runing light weight paper, there is quite an increase in horse-power, and possibly a little excess back pessure that would have to be relieved to the atmosphere, unless there were other facilities, such as heating of beater water or the plant were equipped with a compound condensing engine to take care of the excess back pressure in that way.

If both machines were on heavy paper at the same time, there would not be sufficient back pressure to dry the board, unless you could make it up with live steam, which is very costly. From this data it is found advisable to lay out the orders on the machines, if possible, in such a way as to take care of the condition just mentioned.

We have Jones, Majestic and Standard Jordans and have collected data on these Jordans.

Majestic Jordan — Jordan running empty, plug pulled back, 42 H.P. Jordan running, plug pulled back tak-

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[*] Address delivered at the First Annual Convention of the American Pulp and Paper Mill Superintendents' Association in Buffalo.

ing pipe full of stock, 110 H.P. Jordan running, pipe full of stock and grinding on the shell, 155 H.P.

Standard Jordan — Jordan running empty, plug pulled back, 18 H.P. Jordan running, plug pulled back taking pipe full of stock, 31 H.P. Jordan running, pipe full of stock and grinding on the shell, 114 H.P.

We have Jones fifteen hundred pound beaters. Beater running, tub empty, 9 H. P. Beater roll up, tub full of stock, 40 H.P. Beater running, tub full of stock, roll grinding fairly hard, 53 H.P.

Full Information Necessary.

Sometimes mill managers after they return from meetings, tell about this and that mill requiring a certain number of pounds of coal per ton of board. They never come back with the full information as to what they were running that particular week. The mill running on jute cannot come anywhere near the coal record with the mill running on chip board, etc. There are times when there may be one machine on jute and the other on chip, and a fairly good coal record will result. The next week the mill may be running light weight board, which, as my figures show, takes considerably more horse-power in most cases, and with a decrease in production. Then again the following week, conditions may be such that heavy board may be running on both machines, or as many machines as there are, and there is a decrease in horse-power with an increase of production.

Unless there is a good average, there is not much use in comparing coal consumption without comparing with a mill that is making something near the line of board you are.

Markets for B.C. Pulp and Paper

By D. A. MCGREGOR, in Pacific Coast Lumberman.

Where can British Columbia find a market for her pulp and paper? The question is of importance at the present moment, and, with the establishment of new mills and the increase in the capacity of old ones, it is likely to become more and more pressing. The United States is Canada's best customer, taking about four-fifths of the pulp and paper exported from the Dominion, and not a little of that produced in British Columbia. For this province, however, there are disadvantages in depending too much on the American market. The big demand is in the eastern states, and the freight charges are high and the competition from American, Eastern Canadian and even Scandinavian and German mills is keen. It would seem the part of wisdom for British Columbia to look in other directions.

There are promising markets in the south and across the Pacific, but they require developing. Take Mexico. British Columbia has sent shipments of pulp to this country from time to time, but political upheavals have made the development of a steady market impossible. Things have quieted down of late, and word comes from the south that there is likely, presently, to be a large and ready market for pulp. With a view to drumming up trade for the ships of the Canadian Merchant Marine, the Dominion Government recently sent a special representative to Mexico, and he intimated on his return that there were important opportunities in Mexico if Canadians would take steps to seize them. It is expected that Canadian government steamers will be plying before long between British Columbia ports and those on the West Coast of Mexico. If they do, there is little doubt that a goodly part of the cargo carried southward will consist of pulp.

Across the Pacific lies Japan, which in the past has been an important market for British Columbia pulp. Japan has been developing rapidly as a paper making nation, and is opening up trade in this line with China and Australia. In 1914 her paper exports amounted to $1,413,363. In 1920 they totalled $11,262,345, and in 1918 they reached the high water mark of $14,234,400. It would seem at first glance that Japan should offer an excellent prospective market for pulp from this province. However, the prospects are not as bright as they seem. Scandinavian has been cutting into the markets of late, and Japan, which has pulpwood of her own in Manchuria and on the island of Saghalien, has ambitions to become independent in this regard. She is not independent yet, though, and British Columbia is still sending her pulp.

Canada's pulp exports to Japan for the past six years are as follows:

Year.	Tons.	Value
1916	9,126	$ 349,639
1917	5,021	204,417
1918	16,039	1,233,306
1919	31,999	2,775,486
1920	40,119	3,709,968
1921	18,718	1,784,380

(The years are fiscal years, ending March 31)

The following table shows the origin of Japan's pulp imports for the years 1918, 1919 and 1920:

	Tons.	Tons.	Tons.
Canada	20,039	13,759	15,772
Scandinavia	1,506	13,443	25,018
United States	10,363	16,767	9,582
Germany	40	.....	290
Other Countries	.....	1,340	1,509
Total	31,948	45,309	52,171

In China there is a growing demand for paper, and imports practically doubled between 1913 and 1920. Shanghai is the principal market, but there is a good demand in Tientsin, Canton, Hankow and in Southern Manchuria. In 1920 Japan supplied 319,297 piculs (about 22,350 tons); United States supplied 194,095 piculs (about 13,586 tons); Sweden, 182,835 piculs (about 12,798 tons); Norway, 136,326 piculs (about 9,542 tons); and Great Britain 60,567 piculs (about 4,239).

In Australia there is a large and steady demand for paper, particularly for grades that Canada is in a good position to supply. British Columbia did supply this market during the war, but at present practically all the paper imported comes from Great Britain and Scandinavia. There are several reasons for this. Prices were high during the war, and the Australian consumers, thinking they were being mulcted, turned to Europe at the first chance. As a matter of fact, the Canadian producer could have made a greater profit by selling in the spot market, and some of the Australians are ready to recognize that now. The exchange situation, and the fact that Europe offers a better market for the bulk of Australian products than Canada does, has also influenced the situation. Then there is the matter of the tariff. In the Australian market Canadian newsprint and other paper is placed on exactly the same footing as the product of Japan or Scandinavia, while newsprint from the United Kingdom is given a preference of £3 a ton and other grades of paper a preference of ten per cent. ad valorem. This discrimination, coupled with exchange disadvantages, difference in wages and less favorable shipping rates, is sufficient to exclude British Columbia paper from Australia entirely. Australians say they would rather deal with Canada than with Scandinavia, and that Canada can probably secure a preference if she will grant something in return, say on wool, fruits or dairy produce. To get business, she must also meet market conditions and competitive prices. The following figures showing the paper imports of Australia for the fiscal years 1919-20 and 1920-21 indicate how rapidly the Commonwealth market is growing:

	1919-20.	1920-21.	Increase.
Cardboard, etc. ..	£157,436	389,265	231,289
Printing	£1,422,463	3,876,848	2,453,885
Wrapping	£299,102	688,007	388,905
Writing and Typing .	£435,497	995,109	559,612
Other	£535,699	1,126,800	591,101

In New Zealand the situation is somewhat different to what it is in Australia. Canada and all other parts of the Empire are given a substantial preference, and considerable trade is being done. During the first nine months of 1921 New Zealand imported from Canada printing paper valued at £53,180, paperhangings valued at £8,680, wrapping paper valued at £6,452, and writing paper valued at £1,861. On printing paper the new general tariff is 10 per cent., but paper produced within the Empire is admitted free. Formerly the preference was 20 per cent. instead of 10. This decrease is more or less offset by an increase in the preference on wrapping papers and by a preference of 20 per cent. on paper hangings and a preferenc on writing paper where none was granted before. On wrapping paper of all kinds, not printed, if in sheets not less than 20 inches by 15½ inches, or the equivalent, or in rolls not less than ten inches wide, the general tariff is 8s. 9d. per cwt., or 35 per cent. ad valorem, while the preferential rate is 5s. per cwt. of 20 per cent. ad valorem. This is an increase in preference over the old rate of 1s. 3d. per cwt. On wrapping paper in sheets less than 20 inches by 15½ inches, or the equivalent, or in rolls less than 10 inches wide, the general rate is 40 per cent. ad valorem, and the preferential rate 25 per cent.

Mr. Norman E. Wainwright of Montreal, who returned from New Zealand recently, after investigating the paper situation there, gave it as his opinion that, with the preference in her favor there was a chance of Canada's developing a good business with her sister dominion in the south, particularly in writings, bonds, printing and book papers.

MARSHALL'S MINIATURE.

During December last I referred to the miniature paper making machine which Messrs. T. J. Marshall and Co. have at their North London works. A big store in the City—Selfridge's—has borrowed the machine and the ladies who go to try hair-pins and other accessories can step into the "next department" and see paper being made from Canadian pulp. The machine, which is 7 ft long, attracts great attention and surrounding it are all kinds of printing machinery. It is stated that this little newsprint machine originally cost £600 to make. That being so, Marshalls were not asking too much when they stated sometime ago they would sell it for £650.

WE CANNOT SUCCEED BY WASTING

"Anyone would think you was paying for it to hear you talk" was the impression that one employee in a certain paper mill made to another when one of these men called the other's attention to a certain waste which he was causing.

During recent months ,on account of shrinking profits, an edict had gone forward that the cost of running this plant would have to be drastically cut. Heads of departments found that the required reduction could not be made without laying off a considerable number of employees. One of the first to be laid off was the young man whose remark is quoted above. His superior knew that this man gave little thought to preventing waste, but used up supplies and materials carelessly and recklessly. By laying him and his type off, the saving was not only in his wages, but in a lot of waste.

During the war extravagance ran rampant in many paper mills, as well as in all other kinds of manufacturing establishments. So many dollars were to be had that the pennies were not counted. Economy was regarded as unnecessary. Those in charge of materials and supplies handed out orders on any kind of requisition, the principal thought being to get out production without consideration of the cost. When the need for this break-neck speed ceased, the spirit of economy did not return as it should have done. When the collapse in general business came, this institution was rather badly hit and orders immediately went out to retrench. Outside efficiency experts were called in and they not only weeded out a large percentage of the working force that was not efficient, but were able to double-up many positions, and they installed a thorough watch on everything that went out in the shape of materials and supplies, and a careful record was kept of everything issued. An investigation was made as to the amount of supplies each department must necessarily have.

In times of stress like these the employee who has been wasteful is the first one to be without work. All business must be run at a profit or cease to be run. The more loafing and more wastefulness carried on in an establishment, the less will be the profit. When these profits are large, most employers are disposed to treat their employees generously, but when profits fail, it is then necessary to cut out everything that does not produce efficiently, whether this be employees or material.

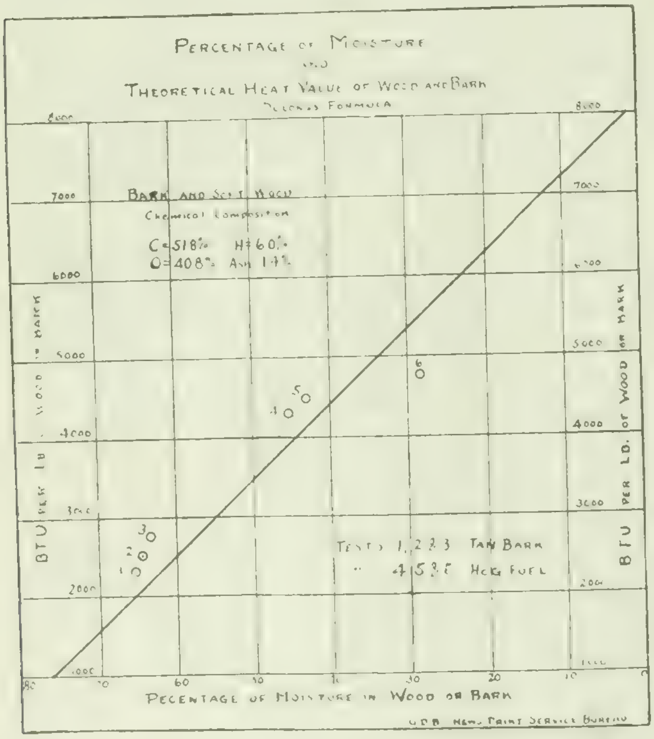
Profits must first be earned before there is any money to buy supplies or pay employees. The best method to assure a profit in any business is for everyone to work intelligently and hard and to exercise economy in all directions. The employee who does this is helping to make it possible for his or her employer to pay wages and improve working conditions. The employee who wastes either time or materials is doing his or her worst to bring about lower wages and less favorable working conditions.

It is much worse for an employee to be wasteful at business than at home, for at business this employee is misusing what is not his or her own, and this is pretty nearly being dishonest. Anyone of the right caliber would rather waste his or her own time or material than that which belongs to someone else, but it is often the person that is most careful with his or her own possessions that is most wasteful with that of the employer's

"Anyone would think you was paying for it"—you are, for unless your employer is making a reasonable profit on his investment and for his time spent, he cannot afford to pay you a reasonable wage. America cannot expect to maintain its leadership unless we turn from extravagance and wastefulness to economy and wholehearted working efforts. It is really economy that brings good times, and we cannot expect the return of normal conditions in America until we have overcome many of the bad habits which we have had ever since the beginning of the war. Every employee, no matter how high or low his position, should see that his time and efforts are devoted to building up the organization with which he is associated, but each one should personally see that any waste in time or materials which has heretofore been allowed, should now cease. This is the work of every man and woman employed in every paper and pulp mill.—The Paper Indurtry.

WASTE BARK FOR FUEL

An important paper mill problem that has received little attention during the last few years is the use of bark as fuel. The development of the drum barker has altered the problem of burning the bark and refuse in the wood room. The fact that a majority of barking drums are continually revolving in water results in a waste bark of very high moisture content and low fuel value. Because of this, the main object of many mills has been to dispose of the wet bark this method of disposal.
in the easiest possible way, usually by running it into the river. A few mills have found it impossible to dispose of their waste bark in such manner and have attempted to burn it in Dutch ovens by adding a small amount of coal, assuming that practically no heat value has been derived from the bark by



Dry hog fuel and comparatively dry bark has been burned to a large extent by many mills. One of the most recent examples of this utilization of waste wood is in a large power plant in Portland, Ore. At this plant the steam is made entirely from the heat derived from waste hog fuel which is obtained by near-by lumber mills. Of course this type of hog fuel is comparatively dry and the fuel value is high.

The problem of the utilization of waste bark is dependent to a large degree upon the method of removing the excess water. The heat value of this fuel is directly dependent upon the moisture content as is shown by the following theoretical curve of heat value by fuel worked out from Dulong's formula.

Evaporative test of different types of bark and hog fuel are indicated on the curve. Tests 1, 2 and 3 are of considerable importance because they were made upon tanbark and carefully conducted in accordance with the recognized Boiler Test Code of the A. S. M. E. All of the tests indicate that the theoretical heat values are supported by actual operating figures, thus proving the comparative accuracy of the curve.

Assuming that ordinary bark comes out of the drums carrying 75 per cent water the curve gives a theoretical heat value of 1,000 B. T. U. per lb. of wet bark. If it is possible to eliminate one-third of this excess water and deliver the waste bark to the boilers 50 per cent dry the heat value per lb. of refuse is about 3,500 B. T. U., an increase of 250 per cent per lb. of material fired. Assuming 15 per cent barking loss in a mill that consumes 200 cords of wood per day there will be available as fuel 30 cords of bark. Assuming that a cord of bone dry bark weighs 2,000 lbs. the weight of 30 cords of bark plus water is 240,000 lbs. for a 75 per cent moisture condition and 120,000 lbs. for a 50 per cent moisture condition.

240,000 lbs. of wet refuse with a value of 1,000 B. T. U. per lb. is equivalent to 9 tons of coal (13,000 B.T.U.)

120,000 lbs. of refuse with a value of 3,500 B. T. U. per lb. is equivalent to 16 1-3 tons of coal.

This indicates a saving of the equivalent of 7 1/3 tons of coal by pressing the bark to 50 per cent dry. With coal at $6.00 per ton the gross saving would be $44.00 per day. This amount would cover the cost of removing the excess moisture in the bark and leave an appreciable balance. Mills that do not attempt to burn this refuse bark would be able to utilize the equivalent heat value of 16 1/3 tons of coal.

There are several makes of bark presses on the market which are claimed to remove a large amount of excess water. However, there is some question as to the amount removed in the ordinary operation of a mill because of the knots and lumps that are mixed with the wet bark. But they undoubtedly increase the fuel value of the bark and it will burn much easier under the boilers. Further developments of bark pressing apparatus will undoubtedly secure better results so that in the near future we can expect to consistently obtain bark that is at least 50 per cent. dry. Considering the great amount of bark removed every year, this will make possble the utilization of considerable material that is now wasted.

PULP SITUATION BETTER IN NORWAY

In the Norwegian paper mills there are in all ninety paper machines, only thirty-five or forty being in operation on January 1, according to U. S. Commercial Attache Norman L. Anderson of Copenhagen, Denmark.

For the first nine months of 1921 the paper production is estimated at about 65,000 tons, as against 223,000 tons in the same period of 1920. Stocks at present are not large, and the resumption of work on a greater scale at the mills depends on market conditions.

For the chemical-pulp mills the prospects seem brighter. Four of these mills were at a standstill at the beginning of the year, but two of them will shortly resume operations. The other twelve Norwegian chemical-pulp mills, including the Borregaard mill, which is the largest have been running since last fall. The production of chemical pulp during 1921 is estimated at about 150,000 tons, as against 224,00 tons in 1920.

During the period from January to November, 1921, Norway exported 53,917 tons of printing paper.

Transactions of the Technical Section.

Discussion of Papers at Annual Meeting

Were do we Stand?

(Continued from the last issue.)

MR. CARRUTHERS: I see by the program that amongst those who are to participate in the discussion is Dr. J. S. Bates.

DR. J. S. BATES: Mr. Chairman and Gentlemen, you will have noticed that my name begins with the letter "B", and, because it is near the head of the alphabet, I always seem to be "picked upon" when it comes to a discussion.

This is a very broad subejct and in some ways a delicate one for a technical man to talk about. For that reason I am sure that we are all grateful to Mr. McInnis for introducing this discussion. As a matter of fact, Mr. McInnis proposed the subject, and we therefore forced him to lead the discussion. We have attracted a good many of the managers of the mills to our meetings recently and I only hope that we may be able to induce more of the managers to attend our meetings, take part in our discussions, and give us the benefit of their leadership.

Referring to the question of science in general, Germany has been given a good deal of prominence for her development of science during the last fifty years. Many of our predecessors who took scientific training went to the German universities. The present generation have not felt the need of going to Germany. Many of them have gone to the United States. The next generation will not have to leave Canada for the highest scietific training. I merely mention this point to remind ourselves of one phase of the development of science in different parts of the world, not that the reference is a reflection on the scientific capabilities of different races but as a reminder of the stage that has been reached in different countries. The same comparison, I think, will be found to apply to the relations of science to industry in different countries. My point is that Canada has not yet reached the thorough application of science to industry and I do not think that any of us will pretend that she has. There are very few Canadian industries that are developed enough, large enough or specialized enough to warrant the organized application of research methods to their industrial processes.

A very interesting change has taken place in the United States in the last ten years. This has struck me forcibly on account of having taken my technical training in the United States about ten years ago. At that time the United States was in somewhat the same mental attitude towards science that Canada is at the present time, although the comparison is hardly fair on account of the great difference in the populations and the scope of industries in the two countries. The United States has developed rapidly in a scientific way and science is being applied in a much more logical and definite way than ten years ago. A striking example of this fact came to my attention in reading an article a short time ago in connection with war service. After the United States entered the war, they formed a new branch called the Chemical Warfare Service. In their usual vigorous way they organized quickly and thoroughly, operated on a large scale, and played a great part in the war. The statement was made by a gentleman who ought to know, that practically every chemical problem which was put up to this special service was solved satisfactorily even in the short time at their disposal although they had generous war-time support and lots of money. It was a striking example of the practical possibilities of quick action in research. The writer of the article may have been prejudiced but he believed that the results achieved with an expenditure of $2,000,000 were fully as great as those derived from any expenditure of $200,000,000 on actual war materials in the general line of war endeavours. If this statement is even approximately true, it is a great tribute to the power of science and to the speed of research under favorable conditions.

Turning to the pulp and paper industry, we find that it is not perhaps as highly organized in a scientific way as many other industries, such as the electrical industry, which are more directly based on technical foundations. Only a few years ago the pulp and paper industry was certainly small in Canada, but now it has assumed relatively large proportions. We find ourselves with an industry that is far greater than we could have if we were limited to the markets of our own country. It is large because it is based on export business to a great extent, and at the same time it has a firm basis in our forests and water powers.

The growth of the pulp and paper industry in Canada certainly has been rapid and for that reason it is hardly to be expected that all phases of endeavour in connection with it should at this time be highly organized. I think we will all agree that it is no real reflection on the Technical Section, or on technical men as a whole, that perfection has not yet been reached in the development of the industry in our own country. Five years ago there were few technical men in the pulp and paper mills of Canada. We have only to review the yearly lists of membership of the Technical Section to impress upon ourselves the very rapid increase in the employment of technical men in our mills. The managements have also undergone a mental change, or perhaps a development, in their attitude towards the technical man. In fact the managements are formulating their ideas along these lines at the same time that the technical men themselves are crystallising their own ideas.

As regards the really important results that are possible from science in connection with our industry, namely, by research, it is hardly time yet to expect a great deal. Those familiar with research know that under ordinary conditions time is a very necessary item and from what I have previously said it will be quite apparent that no stock-taking is in order at present of what has been accomplished along the lines of actual research. This does not hold, however, in connection with mill control work which is in the class of testing and ordinary experimental work where more speedy results are possible.

My idea, if I may express it in this way, is that the time is ripe for us to plan the ultimate organization of the technical men in the pulp and paper industry of Canada for permanent progressive work along experimental and research lines. The main facility at the present time is the group of technical departments in the different mills. The great bulk of our membership may be found in the technical organizations of our various mills. My argument for the past year or so has been to make the best use of these existing units and as far as possible, coordinate their efforts and keep them cooperating.

The real thing, as far as the object in view goes, is fundamental research. I shall not undertake to elaborate this phase of the subject, but I think it is very important that we should recognize the great possibilities of tackling and solving the fundamental research problems which have so vital a bearing on the development of this great pulp and paper industry. That is not possible without time, organization, money, support and a great many other things. But I do think that the thought and energy of the Technical Section might very well be directed to finding ways and means of accomplishing this ultimate aim.

One other thought is that the national unit is an important limitation; not so much in science in general, for we hardly stop to think of national boundaries in the field of science, but we are dealing now with a particular industry and we have our interest mainly in the industry in this country. We are not inherently, or at least should not be, competitors with one another. Our competitors are the pulp and paper mills in other countries. I do not want to express any narrow ideas along this line but rather to dispel any doubts there may be about the advantages of cooperative work by Canadian mills. We will be far better off if we exchange ideas, help one another, work together for our own benefit — somewhat selfish though that attitude may be — than if we fail to do so and allow the industries in other countries to get all the benefits of such organization.

MR. W. B. CAMPBELL: Mr. Chairman and Gentlemen, Mr. McInnis has brought up a very large question here. I am not going to attempt to cover anything like the ground that he covered and for two reasons. I may probably be somewhat in the position of the cobbler who is admonished in the old proverb to stick to his last. There is another proverb, which, freely interpreted, tells us that if we look after the cents the dollars will look after themselves. When I was asked to speak on this subject, I was curious to know what line the discussion would take as the title seemed rather vague to me. But I will say that the greater advance the technical men make, the more problems they will have before them for solution. For every problem solved, two or more should open. One has no conception of the possibilities of multiplication until he starts to learn divisin, but when he has learned multiplication, and then division, the whole field of arithmetic opens up and he is beckoned on towards algebra, calculus and perhaps relativity. Fifty years ago there were probably many men willing to admit that what they did not know about pulp and paper making was hardly worth knowing; they were quite content to continue on the lines which they had been following. To-day men who take this attitude are being forced to one side. As Mr. McInnis has said, the question is not so much where the technical men are anxious to lead us, or what problems they are going to solve in the future, but the question is how these problems are going to be faced and solved now. But the technical men are the only men in the industry who can, as it were, smell out the problems. They have an aptitude for sensing a problem, for finding out that it is there and that goes more than half way towards solving it. It should not always be necessary for a technical man to find out a problem and solve it too. We have in a mill, and sometimes in the management, a man who has not the fundamental knowledge necessary to make those operating the mill realise where a lot of their wastes are. An ordinary 1,000-pound beater heated to 50 degrees in an hour requires 30 horse power of steam. If you tell that to the ordinary, average mill man who is not an engineer, he will not believe it; it does not seem reasonable. He calls that a theoretical calculation and he will not have very much to do with it. From his point of view, the saving by eliminating, or cutting down, that steam waste is very trifling and the inconvenience it would cause him is tremendous. Therefore, it is not done. If you insist upon it, and probably repeat that condition in two or three other instances, the first thing you know there is a feud developed between the mill man and the technical man and under these conditions the technical organization goes to pot. The blame for that is not altogether on one side. The mill man has learned by experience the most convenient ways of doing a great many things, but he has not in the past had the opportunity of checking up the cost of doing those things in these ways. The technical man points out the waste of steam in this instance but he does not perhaps realise what that convenience means to the mill man or what its actual value is in dollars and cents. It is rather an indeterminate sort of thing.

The next problem is to bring these two men together in such a way that they can discuss problems of this kind and a good many others without prejudice, so that they can talk the same language to each other and come to conclusions which will be based on reason, mutual understanding, and consideration for the interests of the industry.

To some extent, the educational course is a step in the solution of this problem. I believe that if the mill man of experience, who is not too old, and there are not very many of them, will master the two first volumes without difficulty. He will then find himself armed with knowledge of very great value to him along with his experience and a lot of things which he knows now but only in a vague way will be made clear to him. I fancy he will be greatly surprised at what he will get out of these two volumes. He may be as much surprised as the man who bought an automobile without knowing anything about machinery. He was able to run it for a couple of weeks before it broke down, as it finally did. Then he called in a mechanic who opened up the hood and began pulling out the vitals of the machine. "Gosh" said the man, "I never knew all those things were in there."

With the knowledge that the mill man can get out of these two books, he will find that he can talk with the technical man on his own ground. He will know how to present his own side of the case in language which the technical man understands. You probably realise that the mill man has a language of his own and that the technical man has a language of his own. The mill mn will be able to judge of the soundness of the proposals of the technical man. If the technical man has a good idea the mill man will grasp it and be able to apply it. If the technical man's idea is faulty the mill man will be able to judge of the soundness of the prodo now. At present he feels aggrieved because he has something forced upon him that he does not understand.

Besides the knowledge of fundamentals, I think it would be a good thing to have the mill man realise just what the experimental method means and how experiments are conducted. If we could have a central laboratory—and we will have some day, I expect and where picked men from the mills could be sent to work out problems of their own mills under the guidance of experienced technical men, and save them from the necessity of working them off their minds in the processes of production, I think it would have a wonderfully invigorating effect all through the industry. Such experience and training would not only result in the solution of problems, but it would start a man thinking — thinking about his daily work. His mind would become a breeding place of ideas, and not only his mind, but the minds of all those men around him, because it is not natural for a man to keep knowledge to himself. If once we get the men in the mills really interested, and thinking with intelligence, based on dollars, I believe the technical men will have a merry time keeping up with the problems that will present themselves for solution. That is a condition to which we may look forward if the educational program of the section is carried out.

MR. HOVEY: Mr. Chairman and Gentlemen, of course, I am more or less familiar with this argument. As Mr. McInnis says, he and I have spent some six to ten hours at a time on the topic and I am not sure but that he has taken from me a lot of my pet hobbies. A number of interesting subjects have come up during the course of the discussion, but there is one point that I want to speak about and that is published data. Published data in the technical periodicals in practically all cases takes the form of a report on some detail of some operation or a progress report on research done as a rule in a private laboratoy or by an individual. It seems to me that one of the things the technical men could do is to sell to the management the idea of publishing a little more of the work that is done in the mill. Even though it is not fundamental in its nature it is still close enough to the fundamental to bring out the good broad line of thought. While Mr. McInnis refers to published data in support of his argument, he does not by any means deal with the work that is being done in the mill and is never published.

I can only say that I thoroughly agree with most of what Dr. Bates and Mr. Campbell have said in regard to a central organization—some place where fundamentals can be developed. If anybody is studying the organization of a technical department in a mill, or rather if he is studying development from the point of view of the technical education, he has to transmit from the technical organization to the mill man the results of that study and it immediately becomes apparent that there is a lot of fundamental work to be done. When he undertakes to develop along lines of control in order to produce economy and quality, he gets only so far with the work. But, he has to go farther, and to do this he has to have more trained men available. It may run into a good many thousand dollars a year. This means that fundamental work has to be abandoned, or developed along empirical lines, therefore some form of organization to take care of this work is essential. The central form of organization is very important. Dr. Bates brought out a very good point, namely , that the technical man is just beginning to crystallize what the mills really require.

With regard to the duties of the technical man—duties both to himself and to the management—it seems to me that they point in the direction of education. The technical man should make it an important part of his duties to introduce and sell educational policies to the management and try to introduce educational work into the mills. I thoroughly approve of Mr. Campbell's argument that if the technical man wants to develop his work he must have the assistance and cooperation of probably the most valuable man in the mills, namely, the operator. The operator can provide him with all the assistance he requires if the operator has a knowledge of the fundamentals as a result of the educational facilities which have been afforded him. I think that the statement of Mr. McInnis that there is a necessity for organizing the technical men is important. Their work should be so organized that it can be placed where most essential and best used to produce results. Part of this is a problem for management. Of course management will always have to do something to take up the slack in the organization between the technical and operating departments and it should be part of the technical man's work to see that management knows his objectives and results. This automatically places management in a position to use his technical department to best advantage. The technical man should furthermore spare no effort to make clear his objectives and results to the operator. Nine times out of ten he will be assisted if his work is sound.

MR. CARRUTHERS: Now, Gentlemen, I think we should hear from the management again. Mr. F. J. Campbell, I see, is here, and I would be glad to have a few words from him.

MR. F. J. CAMPBELL: Mr. Chairman and Gentlemen, I did not come here to say anything; I came here to learn something, but since the call of the Chair is imperative, I will make a few remarks on what has been said. The need of a research bureau has been pretty well emphasised by all. I think no one was more disappointed than the President of our Association that the research bureau was not established at Ottawa on the lines that we talked of. We hope that with a change in Government a change of policy will take place and that the National Research Bureau will be established. It will, I think, be of the very greatest benefit to this industry.

In listening to the remarks which have been made from the two sides, I am reminded of what "Old Gorgon" Graham said in talking to his son. He told his son when he was going into those big works, that when he was on the selling end the more he knew about the manufacturing end the better, and that when he was on the manufacturing end the more he knew about the selling end the better. The more the management know of the technical end the better; the more the tchnical men know of the management end the better.

I was very much interested in what Mr. McInnis said about the mangement of the mines, and I believe that if the technical men organized themselves on the lines suggested as managers, nothing on earth could keep them from getting to the head of the pulp and paper manufacturing industry in this country. If the technical men organize themselves as managers, the better for the industry and the better for themselves.

Take the little problem that Mr. Campbell mentioned, —that the technical man will come along and tell the operator that it takes 30 horse power of steam to heat his beaters. If the technical man will come along and tell him a better way to do it he will become a manager right off, and that is what we want in the industry.

MR. L. H. SHIPMAN: Mr. Chairman and Gentlemen, I did not come here prepared to discuss this subject. So, I merely have a few half-baked ideas that have come into my mind while listening to the discussion this morning. I do think, though, that it is a mighty important subject, and a timely one, and I am going to give some time and thought to it. I may perhaps break forth in print.

However, on the spur of the moment, this occurs to me: You remember the old saying about the pot and the kettle calling each other black. We will not make any progress if the management merely says: "You technical men are weak; you are to blame for the situation which exists to-day, namely, that there is not the progress being made in our plants by you technical men which we think should be made." It will not avail anything if the technical man says to the management: "You are wrong, Mr. Manager; I certainly have done all I possibly could; if you had helped me more we would have made more progress." When the discussion is of that sort we will not get anywhere. There are several reasons why. Do not imagine that there are only two factors, two sets of people entering into the consideration of this subject. There is a third, our friend the mill man. If the management and the technical man squable about who is to blame and forget entirely the fact that the mill man constitutes an important factor, the general superintendent and the department superintendent, we will not get anywhere. It is not a question of who is to blame; it is a question of stating the facts which exist.

I agree with Mr. McInnis absolutely. There can be a great improvement in the amount of good work for the industry which the technical man can accomplish —not alone, but with the assistance and cooperation of the mill man. The technical man says: "It is not my fault, I am doing as well as I can, I am doing a whole lot and you do not realise how much I am doing."

We must acknowledge existence of a certain fact and it is this: During the last six or eight months business in the pulp and paper industry has gone from bad to worse. Have you seen a great many general superintendents or department heads out of jobs? No. Have you seen many technical men out of jobs? Yes. You have seen in mill after mill the technical departments either absolutely done away with or reduced to a single individual, perhaps the man who has been in charge of the department. There must be a reason for it, and, in seeking the reason, do not blame the individual. It is not the individual that you have to consider; it is a set of facts. Why is it so? Is is not that the management believes that of the two sets of men, during the stringent times, more money will be made by retaining the general superintendent than will be made by firing him and retaining the technical men, or by retaining them both. If that is true, what effect does it have on the mental attitude of the general superintendent and the mill men in general? Since the general superintendent is not discharged in these stringent times while the technical man is, does it not make the general superintendent feel that necessarily he is the more valuable man to the industry, of the two? Undoubtedly it does. Why does this condition exist, namely the cutting down of technical staff in times of financial stress? Is it not so because, up to date the technical man has not demonstrated to the management that he is as valuable to the company as the operator? We will forget for the moment whether he is to blame for that failure to demonstrate his value to the industry. Why is it so? Take Mr. Campbell's little problem about requiring 30 horse power to heat a 1000-pound beater up to 50 degrees. The superintendent is not convinced and he does not want to put into practice a scheme that the technical man proposes because he knows it will put him to a great deal of inconvenience and thereupon ensues an argument. The technical man cannot see anything but the fact that there is a wastage of steam. The superintendent cannot see anything but the fact that he is going to be put to a great deal of inconvenience if he is to save this steam **in the way in which the technical man wishes it to be saved.** Is the technical man aware, in carrying on his studies with a view to saving steam, that the mill man has, by that wasteful method of using steam, perhaps saved himself something else in labour or in some other factor entering into the cost? No, I do not believe that the general run of technical man has made a study of that side of it. He has seen, from the scientific side, the wastage of steam, and that is where he has stood, and that is where he generally stops. He has not been able, on that account, to sell to the mill man a great many of his ideas.

This has been due then to the lack of getting together, and this lack of getting together has kept the technical staff in the position of being pie and cake to the mill and not bread and butter. They are looked on as luxuries and not necessities. Hence when the luxuries are being cut out, out goes the technical man.

Why is there not this getting together? In this case I am going to say the management is to blame. It is the management who decides to buy or discard the technical luxury. Therefore it is the manager who should see that the stockholder gets his money's worth. The management bring these two men together. The underlying cause why it has not been accomplished is that in the past when the technical man has proposed something the mill man has objected, the manager has been unable to take the time to study out the problem in such a way as to bring them together. You can object that it is the technical man's problem to get together with the mill man, since his job hinges on this. All right, it depends on your point of view, whether from the stockholders stand or the technical man. Perhaps you might say the technical man has been a poor business value demonstrator and that the manager bought a new toy and didnt know how to work it.

Some managements have done a good deal in this direction, many are trying to do something. It has been said that we will never get very far with this question until the management does something, or until someone they may appoint will sit down and study the question in such a way that the mill man and the technical man will be brought together. But, we technical men might as well look the facts in the face and realize that so long as in periods of depression the technical man is looked on as a luxury and can be fired while the mill man must be kept on, we never can expect the mill man to make much of an effort towards finding out what in the devil the technical man is trying to do. He naturally will not. If he retains his job when the technical man is fired, that is perfectly good proof to him, and to me also, that **in the eye of the manager,** the technical man, that is pie and the mill man is bread and butter. Mind you, I am not contending he is a luxury, I say, the manager looks on him as a luxury.

I am a technical man, bu I have been more or less on both sides of the fence and I thoroughly agree in general with what Mr. McInnis has said that the technical men are not accomplishing in the industry what I believe they should and could accomplish. If they are accomplishing it, then they are not proving it to the managements. A fall down on either accomplishment or proof of same results is loss of job in 1922. I believe with Dr. Bates that this may be a slow process and we may or may not be up to the point where we can accomplish all we want to in Canada, but whether we are or not, we should face the fact that there are possibilities of advancement and a proper study should be made of the question somehow or other. It is a case of organization planned under ordinary horse sense conditions and I am going to give the subject some thought and, as I say, I may break forth in print.

MR. CARRUTHERS: Are there any other gentlemen who wish to contribute to this discussion?

MR. STEPHENSON: Mr. Shipman, three years ago, made the suggestion to the Technical Section that facilities be provided for the interchange of information in regard to the performance of processes and equipment in mills and that, it seems to me, could be developed practically without any expense, to the great advantage of the industry and to the improvement of the status of the technical men. It would mean the tabulation by the secretary's office of data collected by the different mills in the industry. It would mean that the large expense which one of the speakers indicated would be required to get a lot of information in one plant all at once would be eliminated. That Bureau could be of great assistance also in passing on problems; so that if one problem came up in one mill the other mills would be advised of it. It might perhaps suggest to them the cause of some of their troubles, and, by these mills meeting the same problems getting together, you would automatically double your staff on that particular problem at once. Mention has been made by several speakers of the necessity for the management to hitch the technical man with the operating man in a team which is pulling. It seems to me that there is another factor to come in there if the mill is going to operate up to its greatest efficiency and that is the man who is making the mill's machinery. Every once in awhile we hear of somebody who has installed a machine and after it has been operated a little while, or they have been trying to operate it a little while, they find it does not operate under the conditions for which it has been installed. A screen, for instance does not pass the amount of stock it is rated to pass. They fiddle around in the mill and perhaps dilute the stock from one per cent to three quarters of one per cent, or, at additional cost, they attempt to install an additional size of piping, or to make some other rearrangement in the department, whereas it would probably be found that some other mills had tried out that same screen with some other cut of screen plate and had found the remedy for the trouble. If we could simply begin by tabulating the performance of some of our equipment under different conditions of operation we would be starting in on what undoubtedly would be of the greatest assistance to the mills in operating and in being able to purchase equipment whose performance could be definitely stated and which statement could be relied on.

Take the development of new machinery. Canada is probably the leader of the world in the installation of electrical drives These drives require a good deal of research at the mill in adjusting this electrical equipment to operating conditions. It is obviously impossible for a mill to have the service which it is paying for if the technical man and the operating man in the mill cannot cooperate openly, faithfully and intelligently with the manufacturer of the machinery in getting it into operation.

It means the education of the operating man so that he can talk, or understand, the language of the technical man or engineer. The operating man has got to be sold on the proposition, and it seems to me that the way to bring him to appreciate the technical man, so-called, is to show him that if he will cooperate and assist to the greatest degree possible in putting new equipment on an easy and efficiently operating basis, it is going to help him in his daily work, it is going to help him to make a record for himself and it will be to his advantage when pay day comes. It is also some satisfaction to a man to know that he is working side by side with a bunch of men who have been installing absolutely new equipment and making it work.

Mr. Shipman said that he might break forth into print one of these days. I hope he does. The Council of the Technical Section, some time ago, took under advisement the idea of extending this annual meeting thoughout the year by having it understood that a paper sent to the Secretary would be published as a transaction of the Technical Section and that it would have the same status as if he had personally presented the paper here. There are a lot of men who do not feel inclined, or qualified, to get up on their feet to read a paper or speak extemporaneously in such a happy manner as some speakers have done this morning. If they will sit down, bone out the thing and send it in, the paper will be published. The Pulp and Paper Magazine certainly would be glad to extend the courtesy of its pages to members of the Section for the dissemination of information, but the plan of the Publication Committee is to gather such papers, and the papers which are presented at the annual meeting, together with the discussions, and publish them annually in book form.

MR. HAZEN: I have been sitting back here pondering over your very interesting talk. I cannot allow the discussion to close without nailing that fish story which was told by Mr. McInnis. If I remember it correctly he said that the habitant had put it all over the technical man. I know that the technical men are practical. That old yarn about the boy with the willow wand, the piece of string and the fish-hook catching more fish than the well-equipped fisherman does not hold water. We know plenty of technical men who really have some common practical sense and who show it.

MR. SHIPMAN: I just want to say a word because I really do feel very strongly on this subject, as Mr. McInnis does, because he and I have had many conversations on it. The remark, frequently, heard, of bringing the practical man, the operator, into line, goes against my grain a little bit. I have heard it so many times. It is not a case of bringing the practical man into line. Has it ever been established that he is out of line? Has he lost his job in the last three months? Does the same condition prevail with regard to another set of individuals? Perhaps there is some other factor entering into the question. Some individual has pointed out to both parties, the operating men and the technical men, that they each must listen more to the other. Personally, I believe the technical man can do a whole lot of listening.

(In the next issue we shall publish the discussion on "The Manufacture of Woollen Press Felts, with illustrations.)

One who frankly confesses himself to be in the wrong when he is, will be found mostly in the right.

Annual Meeting of Paper Makers Safety Association

The annual meeting of the Ontario Pulp and Paper Makers' Safety Association was held in the office of the Interlake Tissue Mills, Thursday, April 6th. The Pres. Mr. Geo. Carruthers, being in the chair. After the reports of the President and of A. P. Costigane, Secretary-Engineer were read, the Directors were re-elected, Geo. Carruthers, C. Nelson Gain, I. H. Weldon, Col. C. H. L. Jones, P. J Murer, L. R. Wilson and H. F. E. Kent.

After adjourment of the Annual Meeting, the newly appointed Directors met and unanimously appointed Mr. C. Nelson Gain, President in place of Mr. Geo. Carruthers who retires.

Mr. H. F. E. Kent was elected Vice-President, and M. A. P. Costigane was reappointed Secretary and Engineer.

The President's and Secretary's reports were as follows:—

THE PRESIDENT'S ADDRESS

Annual Meeting, April 6th, 1922.

By GEORGE CARRUTHERS

Gentlemen:—

The period of activity to be reviewed at this time, viz: the year 1921, will long be remembered in the pulp and paper industry of Canada. The change from the peak of prosperity to the depth of depression was so sudden as almost to take our breath away. Fortunately the mills in Ontario were conservatively managed, and while all suffered acutely from reduction of market price, drop in inventory values, and lack of orders, they practically all weathered the storm and are perhaps to-day, owing to their recent experience, in a better position to compete in the world's markets than ever before. The Safety Movement, however, has gone ahead, and although there has been a tendency on the part of some mills to slack off, good work has been accomplished. During the year the Accident Prevention Competition held the interest of the employees and possibly was responsible in a great measure for the reduced number of both fatal and non-fatal accidents. If the competition was responsible for the prevention of one serious accident, then it was indeed worth while. The trophies took the form of two shields of graceful design, and beautiful workmanship, mounted on wood sawn from a beam taken from the ruins of Old Don Valley Mill, the first paper mill to operate in Ontario. These shields were accompanied by commemoration flags made of silk and bearing a suitable inscription. I had the pleasure about ten days ago of presenting on behalf of this Association the Shield and flag won by the Don Valley Paper Co. Ltd. for the best accident record in class B. The meeting of employees at which the presentation was made was a most enthusiastic one. Our Secretary and Engineer in this connection addressed the winners on the matter of co-operation for accident prevention. He then turned over to the victors the Shield and Banner, and the pleasure and satisfaction of having won the trophy was discernible in their faces. The presentation to the Dryden Paper Co. Ltd., winners in Class A. has not yet occured, but will take place soon.

Accidents

The accident record for the year shows a decided improvement both as regards frequency and severity. It is to be hoped an even greater improvement will take place next year. The Secretary-Engineer will in his report dwell more fully on this subject.

Calendar

A Safety Calendar comprising twelve illustrations on Safety subjects was distributed among the mills towards the end of the year. A feature of this calendar was the emphasis placed on accidents in the home, and the necessity of parents taking more pains to inculcate safety habits in children from the infantile stage on. Unfortunately, owing to the disturbed condition of the industry during the year, the edition was much smaller than previous years and so this effort of our Secretary Engineer, which involved much thought and hard work, did not accomplish all that it might have done had the circulation been on a greater scale. The number of copies distributed among the mills in Ontario numbered 2146 against 3925 the year previous.

Workmen's Compensation Act

There has been no change in the scope of the Act during 1921. There is now I believe a demand being made by labor interests to increase the scale of compensation from 66 2-3 p.c. of earnings to 75 p.c. of earnings during disability. Legislation to accomplish this purpose is eagerly being pressed for by labor members, and is strenuously opposed by the Canadian Manufactures Association on behalf of the manufacturers. The vacancy on the Workmen's Compensation Board, caused by the death of the late A. W. Wright, has been filled by the appointment of a labor nominee in the person of Mr. H. J. Halford of Hamilton as Vice-Chairman. The manufacturers are much dissatisfied with this appointment, on the ground that a promise had been given them by the government that no labor representative would be appointed unless a representative of the manufacturers was appointed at the same time. The manufacturers are now agitating for re-organization of the Board, and legislation increasing the personnel from 3 to 5 is expected to go before the house at an early date. In the event of such legislation going through the manufactures will probably be asked to nominate a man to fill one of the positions created.

Finance

The audited statement of receipts and disbursements, copies of which are available, show the cost of running the Association during the year amounted to $5,129.28 as compared with $4,964.55 for the year 1920. The figures for 1921 include an item of $201.88 for competition shields and flags. The financial statement shows the affairs of the Association continue to be carried on very economically.

SECRETARY & ENGINEER'S REPORT

By A. P. COSTIGANE

The period under review in this report viz:—the year 1921, might aptly be described as the Halt and Study'' year of the Canadian Pulp and Paper Industry. During the previous two or three years everything was on the boom. The price of paper scared, wages, raw material and production scared, in fact everything soared with the exception of efficiency and quality. The question was not how cheaply could pulp and paper of good quality be produced, but how much extra production could be obtained to supply the ever increasing demands, irrespective in some cases of quality or cost. Two or three years of such trade conditions is sure to breed doubtful habits both in employer and employee, and when the slump came, involving price reduction and partial production, both employers and employees found it necessary to "Halt and Study" their positions. Practically the whole of 1921 was taken up re-adjusting values, and writing off inventory losses. Fortunately in the pulp and paper industry these adjustments were made with the minimum of disagreement between those who employ and those who work. Prices, wages and in some cases raw material seem now to have reached rock bottom and indications point to fairly steady production during the current year.

Such being the conditions ruling in the industry as a whole, the Safety Movement came in for its share of hard knocks. Fortunately the directors of the Association, foreseeing a period of stagnation, wisely inaugurated an accident Prevention Competition, the prizes taking the form of Shields and Flags. This competition which appealed strongly to the sporting instincts of employees served to keep interest alive in the majority of the mills, and proved a great success. The mills were divided into two classes: Class A. employed 200 people and up, and Class B. employed under 200 people. The Class A. trophy was won by the Dryden Paper Co. Ltd. with a record of 24 non-fatal accidents involving lost time amounting to 374.5 days, equal to 2.31 days lost time per full time worker. The Class B. trophy was won by the Don Valley Paper Co. Ltd., with a record of 1 non-fatal accident involving lost time amounting to 1 day equal to .023 days lost per full time worker. These mills will, therefore, each be presented with a Shield and a Flag. The shields will remain in their possession during the current year, but the flags will be their property for all time, and will serve as a daily reminder of their success in heading the accident competition during the year 1921. The competition is now in its second year and judging from the queries put to the writer by employees, the trophies should be even more keenly fought for this year than last.

Employees Meetings

Owing to unsettled conditions, fewer meetings of employees were held. In a number of mills, however, meetings of superintendents and foremen were convened for the purpose of reviewing the position of Safety education, and securing their assistance and co-operation in awakening interest in the Safety Competition. Meetings of foremen are now much more interesting and satisfactory than in the past. It is now a rare thing for a superintendent or a foreman to oppose anything being done to prevent accidents. They have come to realize that they are to a certain extent responsible for carelessness or ignorance of hazards on the part of the men under their control, and are doing their share to instil careful and cleanly habits in their men.

Meetings Attended

The following meetings were attended by your Secretary during the year:

(1) Annual and summer meeting of Technical Section of the Pulp & Paper Association.

(2) Various meetings of Committee on Vocational Education.

(3) Annual Convention, Ontario Safety League.

(4) Various meetings of Executive Committee, Ontario Safety League.

Workmen's Compensation Act

No amendments have been added to the Act during the year 1921.

Workmen's Compensation Board's Report, 1920

The Board's report for 1920 shows an increase in accidents paid for in all industries from 28,788 non-fatal and 197 fatal in 1919 to 37,443 non-fatal and 219 fatal in 1920, or an increase of 30.06 p.c. in non-fatal and 11.16 p.c. in fatal accidents. Medical aid only accidents increased from 9886 in 1919 to 14,126 in 1920, equal to 42.8 p.c. The writer has not been able to secure information as to the total number of full time workers in all industries during 1920, and so cannot make a comparison from that angle.

Accidents

The total number of accidents in Ontario pulp and paper mills, exclusive of woods operations compensatable and non-compensatable for the year 1921 is 1203, exclusive of 9 fatal accidents, involving lost time amounting to 20,759.5 days compared with 1,455 non-fatal and 17 fatal accidents during 1920 with lost time of 25,453 days. These figures show an improvement of 17.31 p.c. in frequency and 18.44 p.c. in severity in the case of non-fatal accidents. Fatal accidents decreased by 47 p.c.

During the year 1921 seven mills were added to the list. These new mills were responsible for 81 accidents involving lost time of 375 days.

These figures are encouraging in so far as they indicate that the peak has been reached both in frequency and severity, and the tend now is in the downward direction. It is to be hoped that the 1922 figures will show even a more decided tendency in the same direction.

Correspondence

Outgoing letters to the number of 1306 have been handled through the office of the Association during the year, dealing with accident reports, statistics, inspection reports and general correspondence. This correspondence has been conducted at a cost of $456 for clerical assistance, an average of $38.00 per month, or at the rate of 2.9c. per letter. The volume of correspondence is increasing rapidly, so much so in fact that the full time services of a stenographer will soon be necessary.

General

Before concluding this report it might be of interest to describe briefly a new development of the Accident Prevention educational campaign. Some time ago it was suggested by one of the Directors of the Association, that it might be a good thing if closer co-operation could be obtained between all the association organized for the prevention of accidents. Just at that time a re-organization of the Industrial Accident Prevention Association had been concluded. A new secretary had been appointed, a man of large accident experience, of broad mind, and anxious to help in any way possible to further the cause. The change thus brought about made it easy for your secretary to approach the Secretary of the Industrial Accident Prevention Associations for the purpose of advocating close co-operation among all the Safety Associations. As a result of many conferences a scheme was outlined for mutual support. Meetings were held at which the following organizations were represented: Workmen's Compensation Board. The Department of Labor. Ontario Safety League. Electrical Employers' Association. Industrial Accident Prevention Association. Lumberman's Safety Assocation. Ontario Pulp and Paper Makers' Safety Association.

Various schemes were suggested to impress on employers and employees the necessity for greater effort in the prevention of accidents. One suggestion especially received the unanimous support of all representatives, viz:—the holding of a joint Safety Convention in Toronto under the auspices of all the Associations interested. Sub-committees were immediately appointed to make the necessary arrangements. These arrangements have now been completed and one of the largest Safety Conventions ever held in Toronto will be (was) convened on April 4th and continued on April 5th, 1922. A very attractive program has been arranged for including papers by experts such as Samuel Price, Esq. Chairman Workmen's Compensation Board; Dr. C. L. Starr, Prof. of Surgery, University of Toronto; S. J. Dickson, Chief Constable, Toronto; Lt. Col. W. N. Ponton, K.C.; Mr. Munro Grier, K.C., J. H. Martin, Bell Telephone Co.; Frank R. Ewart, Toronto, Vice-Pres. American Institute of Electrical Engineers; Dr. M. M. Crawford, Coroner, Toronto A luncheon and dinner are included in the program and outstanding speakers at each has been provided for. This is the first step along the lines of joint action taken by the Safety Associations, and if the Convention proves a success, will be followed by other efforts to stem the always increasing costs of accident compensation.

The Roamers.— And Australia.

Observations during the past twelve months and since the war ended, show that many firms in England have representatives who are given a roaming commission in the principal markets of the world. They start on a tour from London & other places after a farewell dinner and a good list of instructions, and the policy is to get customers, study the wants & deficiencies of the markets, report on them and if possible establish a connection—or a branch house. The men selected are experts. We have only to look at the part Mr. Holland played in the Australian Tariff question on behalf of the British mill men. His and others names are glorified in England today.

PERTINENT PARAGRAPHS

How we use up our great forests:

1,500,000,000 feet goes into furniture, vehicles and kindred manufactures every year.

750,000,000 feet are required for railroad ties.

100,000,000 cords are used for fuel and chemical products.

6,250,000 cords are used for magazines, newspapers and other publications.

6,000,000 feet are used for boxes, crates and barrels.—*Supply Manufacturer.*

Do not grasp at the stars, but do life's plain common work as it comes, certain that daily duties and daily bread are the sweetest things of life.

Everyone is to bear his own cross, not his neighbor's; and his cross of to-day, not of yesterday or of to-morrow.

The man who talks much about himself is advertising a poor artcile and one in which the public is seldom interested.

If you want a man to do another good act commend him for the one he has already done. Commend him in any case.

One thing that made so good the bread that mother used to make was the appetite the boys had.

PROVINCIAL PROVIDING FOR FUNDS

New financing is planned by the Provincial Paper Mills, Ltd., in connection with the construction of a new paper plant at Port Arthur for the manufacture of high-grade papers. It is anticipated that the details of a new bond issue will be made public shortly. The company is operating a pulp and sulphite mill at Port Arthur, and the new construction will round out the unit at that point. President I. H. Weldon stated yesterday that work had been commenced and a gang of men were employed on the excavations. It is planned to have the work completed and the equipment installed within ten months. The cost of the new building will run in the neighborhood of $1,500,000.

The company, which is capitalized at $5,200,000 preferred and common stock issued, has a funded debt of only $565,000, which is proportionately very small as the distributions of capital liabilities go. The company last year earned its bond interest more than 18 times over in a period of general depression. In the preceding year of 1920, when business was more active, the company earned its bond interest more than 36 times over.

New Pumping System

President Weldon stated that the company had installed last fall a pumping system of sufficient capacity to supply not only the present plant, but the new plant under construction, and future extensions possible within the next five or ten years. Both low and high pressure systems have been installed with a capacity of 1,500,000 gallons of water an hour. The company has been supplied by the city of Port Arthur with 2,000,000 gallons a day, but this supply will now be used as an auxiliary.

Speaking on general conditions, Mr. Weldon stated that the Provincial Paper Mills were now running at full capacity. The company was in receipt of a large number of orders, but it is significant that a great many of them are for a comparatively small volume. He expressed himself as hopeful that conditions would still further improve. This new plant will produce high-grade book paper, mainly for the Western market, and the initial capacity of the extention will approximate 25 tons of book paper a day.

The Provincial Paper Mills Co., Ltd., was incorporated in 1913 to consolidate the ownership of the St. Lawrence Paper Mill Co., Ltd., and the Barber Paper and Coating Mills, Ltd. In 1916 all the properties and assets of these companies were deeded to the Provincial Paper Mills Co., Ltd. In 1920 the company was reincorporated as Provincial Paper Mills, Limited, to include the Port Arthur Pulp and Paper Co., of which it already owned all but a small portion of the capital stock.

The company manufactures book, writing, bond and coated papers. It owns a paper mill, also a coating mill, located at Georgetown, Ont., and one each at Mill Roches and Thorold, Ont., also a sulphite mill at Port Arthur, Ont. The latter commenced operations in 1918, making 50 tons per day of bleached and unbleached sulphite, about half of which has been used by Provincial Paper Mills, Limited, and the remainder sold to other mills in Canada and the United States. It is probable that when the addition to the Port Arthur plant is completed all the sulphite produced will be employed by the company itself. During 1920 the company acquired from the Ontario Government the pulpwood right for 21 years covering an area in excess of 1,300 square miles.

PULP AND PAPER NEWS

In a paper just issued, Dr. J. M. Swaine, chief of the division of forest entomology, Ottawa, describes the destruction caused by the spruce or balsam budworm in Quebec. He states that the loss of balsam is particularly serious, ranging form 25 p.c. to 90 p.c., and adds:

We may not have another outbreak for a generation, or more, but when it does come these conditions will probably obtain; the percentage of balsam in Quebec forests will be very much higher than it was 10 years ago and our pulp industry will be dependent very largely upon balsam for its wood supply. This high percentage of balsam will invite a very heavy injury; but, if we can manage to have a healthy stand of growing balsam, without large areas of mature and overmature timber, the effects of an outbreak will probably be much less severe. This is an additional reason for removing the balsam pulpwood as fast as it can be utilized.

Dr. Swaine says that if wood is covered with green boughs it may be left a long time in the woods without danger of destruction by borers.

The International Paper Company, Three Rivers, P. Q., last week commenced operations by starting their first electrically driven newsprint machine, and their new machanical pulp mill, equipped with magazine grinders.

Mr. Ira Burd, postmaster at Iroquois Falls, is sorry. He did not put ashes on the ice in the post office porch. Mrs. R. S. E. Davies fell and broke her wrist and damages of $500 and $436 were awarded respectivily to her and Mr. Davies, who is a well-known paper maker employed by the Abitibi Power & Paper Co.

The town of Parrsboro, N. S. has ratified an agreement with a Maine firm, which purposes preparing and storing 100,000 cords of pulp wood on the shores of Glooscap Lake covering a period of ten years at an average of 10,000 cords a year at 25 cents a cord. The institution of this new industry means the expenditure of a considerable amount of money in purchasing wharf properties, providing for the conveyance across a roadway lying between the storage yards and shipping piers, together with annual outlay for cutting, hauling and transferring to the upper waters of the lake of the timber required for the cordwaining. This work will be carried on all the year round, and the product will be shipped during navigation periods.

The two pulp mills of the McLeod Pulp Co., on the Mersey River, the Harmony and the Charleston Mills on the Medway, are all running now and are sending their output for shipment to Liverpool. During the first three weeks in March the following tern schooners have loaded at Liverpool from these various mills, mostly for New York and New Haven. The Fieldwood, Maid of Scotland, Joan Kelsburg and William Melburne. Schooners Mary F. Anderson and Evelyn Wilkie are now loading and five or six others are daily expected.

Measure your work with a speedome—not by a clock.

F. M. H. Cushing of Provincial Paper Mills, Thorold, represented that firm at the Joint Safety Convention held in Toronto, April 4th and 5th.

C. de Wolf Reid, of Montreal, was a visitor in Toronto last week. Mr. Reid feels that board mills are entering a period of steady business.

J. R. McGibbon, and H. I. Thomas, of J. R. Booth Ltd., Ottawa, were in Toronto recently. The latter representing that firm at the Safety Convention.

An interesting feature in connection with the publication of the circulars containing the announcement of the public offering of $1,374,500 new Wayagamack 6 per cent. first mortgage sinking fund bonds is the printing of the same on the kraft paper manufactured by the company at their big plant at Three Rivers.

QUICK SHIPMENT OF PAPER TO JAPAN

What is stated to be the shortest time in which any big shipment of kraft paper has ever been made to the far east is recorded by the Wayagamack Pulp just received word of the sale delivery in Japan of over and Paper Mills, Limited, of Three Rivers, who have 100 tons of kraft paper. It was despatched little over a fortnight ago. The shipment was made direct across Canada by C. P. R. and was transferred to C. P. R. stemship at Vancouver for Janpan.

PULP SHIPMENTS FROM NOVA SCOTIA

A despatch from Digby, N. S. dated March 17, says:

The steamer Keyingham, Captain Elliott, sailed from here at midnight, Monday, for St. Louis du Rhone, Southern France, via Halifax, with a cargo of pulp shipped by the Weymouth pulp mills. This will be the Keyingham's last trip here this season as during the summer months the setamers of this line are engaged in the St. Lawrence trade. There is to be one more steamer load here this season, the Gyp, Captain Wood, which is due at Boston today with a cargo of China clay. After discharging she will come here.

TIMBER, PULP, AND WOOD PRODUCTS WANTED

The commercial Intelligence Journal lists the following inquiries:

4541. **Timber.**—A Manchester importer of timber invites offers from Canadian exporters.

4542. **Wood pulp.**—A Manchester firm is in a position to consider offers of chemical wood pulps.

4543. **Paper, boards and twine.**—A Manchester firm inquires for paper, boards, and twine.

4544. **Hickory golf shafting.**—A Manchester firm is in a position to purchase hickory golf shafting.

4545. **Last blocks.**—A Kettering firm is in a position to import maple wood last blocks.

4546. **Pulp.**—A European concern, operating in Brazil, desires to import Canadian pulpwood.

Technical Section

A-4-5. The Testing of Wood Pulp Shipments for Air-Dry Content. The Emerson Laboratory, Springfield, Mass. **Pulp and Paper,** xix, 757-760, (July 21, 1921). Suggestions submitted for consideration to the T. A. P. P. I. on the gross weight of shipment; determination of moisture content of the shipment; procedure in case of a discrepancy; procedure in the case of reweighing baled pulp, roll pulp, hydraulic pressed laps, and unpressed laps; procedure for the taking of samples of baled sheet pulp (domestic or foreign), roll pulp (disc method, strip method), hydraulic pressed lap pulp (trip method, wedge method), unpressed lap pulp; procedure for handling of pulp samples after cutting them; and calculation of the air-dry content of a pulp shipment; together with an outline of the considerations involved. (See also **Pulp and Paper,** xix, 555-560, May 26, 1921.)—A. P.-C.

R-11. Special Pulp and Paper Course at the University of Maine. Paper xxviii, 11, (June 15, 1921). Outline of the summer course given in pulp and paper work at the University of Maine, June 27 to Aug. 5, 1921.—A. P.-C.

K-6. The Manufacture of Esparto Pulp in France. L. Colas. **Monit. Papeterie Française,** lii, 391-395, (July 1, 1921); **Papier,** xxiv, 293-296, (July, 1921). An analysis of conditions in France which prevented the development of a large esparto industry before the war, and of the conditions which now permit of the manufacture of esparto plup which will be able to compete with imported chemical pulps.—A. P.-C.

K-7. The Properties of Paper Pulps. E. Arnould, **Papier,** xxiv, 241-243, (June 1921). Discussion of the necessity of treating the various pulps in such a manner as to preserve their characteristics and make the most of their qualities according to the nature of the paper which is required.—A. P.-C.

K-7. The Beating Process. C. C. Stewart, Harding Paper Co., Div. A. W. P. Co., Franklin, Ohio. **Paper,** xxviii, No. 15, 14, 29, (June 15, 1921). In beating, disintegration depends on the type of beater used, the angle of inclination of the beater roll to the bed plate, the size and weight of the roll, the type of fly bar used, the circumferential speed of the roll, and the grade of raw material. Circulation depends on consistency and propelling. These are briefly discussed.—A. P.C.

K-10. Rosin, or Engine, Sizing. C. Schneider, Knowlton Bros., Watertown, N. Y. **Paper,** xxviii, 22-23, (May 18, 1921). General discussion of engine sizing from a practical point of view, with a plea for the purchase of sizing chemicals on specification.—A. P.-C.

K-12. Recent Developments in Paper Machine Drives. H. W. Rogers, General Electric Co. **Paper,** xxviii, 22-26, (May 11, 1921). Discussion of the use of electric motors for driving grinders, screens and agitators, chippers, conveyors, barkers, beaters and washers, jordans, super-calenders and platers, and paper machines. The various types of paper machine drives are described and discussed, and the General Electric Type of sectional motor drive described and its merits dwelt upon. (See also **Pulp and Paper,** xviii, 915-916, Sept. 2, 1920. This type of drive is covered by Can. patent No. 209,956, March 29, 1921.)—A. P.-C.

K-12. A Fabrikoid Apron for the Paper Machine. Du Pont Magazine; Paper, xviii, 18-19, (May 4, 1921). Discussion of the merits of fabrikoid as a material for paper machine aprons. The fabrikoid is doubly impregnated with pyroxylin to render it waterproof. It has a much longer life than ordinary aprons; it stands greater wear from the wire, and buckling, if not eliminated, is reduced to a minimum. It has been tested extensively at the Augustine Mills of the Jessup and Moore Paper Co., Wilmington, Del., and has proved throughly satisfactory, more convenient and much more economical than those previously used.—A. P.-C.

K-12. Development of Suction Rolls. William Millspaugh, Sandusky Foundry and Machinery Co. **Paper,** xxviii, 15-17, 27-28, (June 15, 1921). The failures of the early attempts to use suction rolls for papermaking were partly due to the fact that no means were provided to prevent pressure between the packing of the fixed member (the suction box) and the inner surface of the rotating member. This was covered by the first Millspaugh patent; and the first suction rolls were used on cylinder machines. Next came suction couch rolls replacing the two conventional couch rolls of fourdrinier machines. Finally, suction press rolls came into use. The theory of the suction roll, the results obtained in various mills by its use, and its merits are discussed.—A. P.-C.

K-19. Manufacture of Coated Paper. Wm. T. Schenck, Champion Coated Paper Co., Hamilton, Ohio. **Paper,** xxviii, 13-14, (July 6, 1921). Notes on the troubles encountered in the manufacture of coated paper.—A. P.-C.

N-4. Turning Boiler Room Wastes into Profits, E. G. Bailey. **Industrial Power; Paper,** xxviii, 21,41, (May 18, 1921). The principal heat losses taking place in the boiler room are excess air, unburned combustible gases, high flue gas temperature, and unburned coal. The proper relation between these losses should be determined so that none should be reduced to the extent that another is increased unduly, and operations should be conducted so that the total losses should be a minimum. A study of these losses is the best way of checking up the savings creditable to soot blowers, regulators, various types of stokers, method of operation, etc.—A.P.-C.

O-3. Boiler Feed Water Purification. S. P. Applebaum, Assistant Technical Manager, Permutit Co., New York City. **Chem. Met. Eng.,** xxv, 23-26, (July 6, 1921). Outline of the respective merits of the various methods used for boiler feed water treatment (boiler compound, lime and soda ash precipitation, and artificial zeolite), with special reference to the advantages of the zeolite water-softening process.—A. P.-C.

P-3. Securing the Loyalty of Employees by Proper Welfare Methods. Paper, xxviii, 9-11, (April 27, 1921). Description of the welfare work carried out by the Fox Paper Co., Lockland, Ohio.—A. P.-C.

R-2. Ulman Stromer—First Chronicler of Paper Making. Dard Hunter. **Paper,** xxviii, 12-14, (May 4, 1921). Extracts from the diary of Ulman Stromer, the first German paper maker, at the end of the XIVth Century.—A. P.-C.

R-2. Classification, Filing, and Indexing System for Pulp and Paper Library. Carleton E. Curran, Director of Information Dept., Mead Research Co., Dayton, Ohio. **Paper,** xxviii, No. 19, 9-11, 23, 30; No. 20, 17-19;

No. 21, 17-18, (July 13, 20, 27, 1921). Outline of a scheme of library classification devised to meet the needs of a technical research organization interested in problems relating to the pulp and paper industry and aiming to cover the entire field from pure chemical considerations to semi-commercial production, and even to be suitable for utilization in a factory library or filing system. It was found practical for filing correspondence as well as for the classification of pamphlets and books. The classification scheme is based on the Dewey decimal system, as it is the most flexible and widely applied system yet devised; but considerable liberty was taken with, and exception made to, it so far as topics relating to pulp and paper are concerned. Under 676, which Dewey devotes to "Paper and Paper Products", have been placed (1) all subjects relating to pulp and paper, the chemistry and testing of all materials used in their manufacture, and the processes, machinery and equipment employed; (2) the chemistry and properties of cellulose and its derivatives; (3) forestry, because of its importance as a source of raw materials in paper manufacture; (4) factory, laboratory, office, and library administration so far as they relate to the pulp and paper industry. A list is given of the numbers and headings of the classification system, as regards pulp and paper subjects, and an index of subjects commonly used is appended to the classification.—A. P.-C.

R-5. Paper Manufacture in Poland. Paper, xxviii 12, 42, (May 11, 1921). Exposition of the status of the pulp and paper industry in Poland before the war.—A. P.-C.

R-3. Business of Purchasing Department. "**Eagle A Unity**"; **Paper,** xxviii, 16, (May 18, 1921). Good buying has been defined as "the ability to secure raw materials and supplies of proper quality, in time for production requirements, at a satisfactory price." Scientific buying requires a thorough knowledge of the uses for which the materials are required and of the manner in which these materials are produced, a close study of market conditions and familiarity with sources of supply, investigation of the standing of the seller and of his ability to carry out his agreement, permanent records of transactions from the time the requisition is received until payment has been made and all records are closed. Quality should be considered first, then service, and price last. The purchasing department should interview the many salesmen who sollicit orders, as many of them are of considerable value and some are indispensable.—A. P.-C.

R-5. Relation of Business Statistics to Management Control. Stephen Gilman, International Accountants' Society, Inc. **Paper,** xxviii, 14-15, 42, (May 11, 1921). Data regarding departmental expenses and departmental results considered together furnish the executive an effective instrument of control; but one without the other is almost worse than useless.

R-6. The Origin of Newspapers. Wm. B. Reinicke. **Paper,** xxviii, 16-17, 40, (May 4, 1921). Historical sketch of the early days of journalism, especially in England.—A. P.-C.

R-6. Printing. W. R. Reinicke. **Paper,** xxviii, 11,24, (July 6, 1921). Brief historical notes on the early days of printing.—A. P.-C.

R-0. The Employee as a Stockholder. Warfield Webb. **Paper,** xxviii, 9-10, 24, (July 6, 1921). Description of the employees' stock participation plan which is in force at the Detroit Sulphite Pulp and Paper Co.'s mill. (See also **Pulp and Paper,** xviii, 485-490, May 6, 1920.)—A. P.-C.

R-9. Provisios of the Fordney Tariff Bill with Respect to Paper and Timber Products. Pulp and Paper, xix, 709-712, (July 7, 1921). Text of the provisions of the Fordney Tariff Bill (introduced in the U. S. House of Representatives on June 29, 1921) with respect to paper and paper products and wood and the manufactures thereof.—A. .-C.

R-11. Summer Course in Pulp and Paper Manufacture at Columbia University. Paper, xxviii 15, 40, (May 4, 1921). Outline of the course given July 5 to Aug. 12, 1921.—A. P.-C.

R-12. Paper Mill Operations. Nelson R. Davis, S. D. Warren Co., Cumberland Mills, Maine. **Paper,** xxviii, 12-13, (July 6, 1921). A discussion of the importance of properly controlling processes and materials in paper mill operations.—A. P.-C.

R-12.A Cost System Necessary to Business. Edward N. Hurley, **American Magazine; Paper,** xxviii 25, (May 4, 1921). Discussion of the importance of a proper cost system.—A. P.-C.

R-0. Permanence of the Paper Industry. Dr. Hugh P. Baker, Secretary of the American Paper and Pulp Association. **Paper,** xxviii, 13-14, 23, (July 13, 1921). The permanence of an industry depends primarily on markets and raw materials. As regards the paper industry, it is assured of a large market in the more civilized portions of the world. Its chief raw material is wood and if it is to continue to thrive it is of the utmost importance that proper care be taken to protect our forests and to give them a chance to reproduce as fast as we use them: we must use but not abuse them.—A. P.-C.

JUST REMEMBER

That—Safety Inspection at Home is even more essential than at the Shop. That—Children need more safeguarding than you do. See that they get it. That—Children love to play with matches and that more children are killed in this manner than from any other cause except street accidents. That—Poison, Concentrated Lye, etc., should be kept in a safe place out of reach of children. That—All stairways should have a Hand Rail. That—Where there small children, porch entrances should be provided with a Safety Gate. That—Porch Swings and Hammock Hooks work loose and should be inspected frequently. That—If there is a small boy and a gun in the house they should be kept apart. That—Dry Cleaning is a dangerous operation. Do you know that the insurance rate on the average dry cleaning establishment is one hundred times as high as on dwellings. "There's a Reason".

D. P. ROBINSON TO BUILD SULPHUR PLANT

The Freeport Sulphur Company, New York and Freeport, Texas, awarded contract on March 24th to Dwight P. Robinson & Company for the design and construction of a complete sulphur mnning plant at Hoskins Mound, Texas. Cloyd M. Chapman has been retained by the Freeport Sulphur Company as consulting engineer.

The Company now operates a large sulphur mining plant at Freeport, Texas. This plant contains one of the largest installations of oil-burning boilers in the world.

The new plant is one of several industrial undertakings recently awarded to Dwight P. Robinson & Company, and indicates renewed activity generally in industrial construction.

British Trade News

(From Our London Correspondent)

London March 29, 1922.

The London "Times" and the "Daily Telegraph" are reduced in price to three cents a copy. Reductions in the cost of paper and output, enable the cheap rates being adopted, but another cent is wanted off to get back to the pre-war prices. Owing to the competition in prices of paper, of all kinds, is gradually getting down to rock-bottom. Recent price lists issued by the mills bear this out, but the system is shown in percentages. For instance, if an order is given for, say, $100, a 2½ p.c. discount is allowed as an extra special concession. They do not say paper was 5 or 6 cents last week, and this week it is 4 or 5 cents. By means of the new system one can see a good reduction in prices, which, of course, only relate to papers in stock.

Canadians and Strawboards

The large quantity of straw going to waste in Canada has from time to time cropped up in paper manufacturing circles and the question has often been asked: what can we do with it? Canadians who read the British Trade News will recall the fact that on more than one occasion attention has been drawn to the Dutch monopoly and the need for competition. In England to-day strawboard demands a good price and stocks are not at all plentiful. It is true that a fortune cannot be made out of strawboards owing to the prices, but, on the other hand, if the Dutch can sell well and develop their industry it stands to reason they are not losing money. Canada wants to give them a little competition and good strawboard will always find a ready market in England and the colonies. It would be interesting to hear what Canadians have to say on the subject—there is no use letting the grass grow under their feet.

More Reductions

While the prices of newsprint remain unchanged, it is notable that at the other extreme end of the industry hand-made paper manufacturers are also announcing reductions in their prices, equal to about 4 and 6 cents a lb. cheaper raw-materials, cheaper labour, and good stocks, are attributable for the announcement. An outlet must be found to get stocks reduced and keep the mills going.

Swedish Troubles.

The recent troubles between the workers and paper mill owners in Sweden, have compelled the pulp mills and their workers to come to a definite agreement in order to avert more trouble. A new agreement has been entered into which will bring down wages by 44 p.c. below the high rates paid during the boom period in 1919. It is estimated that in February Sweden turned out 45,300 tons of sulphite, of which about 12,000 ons went to the Swedish paper mills, while the amount of sulphate reached 15,500 tons compared with the usual monthly production of 20,500 tons. Attention is now being diverted to reducing costs of production, and the "cut" in wages is the first element in the economy programme. The troubles between the paper workers and their employers are not fully adjusted yet.

Welcome Mr. Wainwright!

Mr. Norman E. Wainwright has established himself in an office in Blackfriars House, New Bridge Street, London, E. C. 4. His new office will contain the best products of the Howard Smith Paper Mills, Ltd., and the Provincial Paper Mills, Ltd., and it is right in the centre of the heart of newspaperdom—an ideal spot. It is up to Mr. Wainwright now to let the British consumers see what Canada can do and sell in the way of papers.

A Sign of the Times

Cost of living has now fallen to 86 p.c. in England, as against 141 p.c. this time last year. That is one of the reasons why a reduction in wages is advocated amoungst the paper mill owners, because, like the Swedish mill owners, prompt measures must be taken to ruthlessly "cut" down the costs of output if British paper is to find its ways into the home and overseas markets. Present prices are not favorable to consumers of paper and the Labor Ministry in a return this week states that owing to the lack of orders in the paper mills employment is irregular and for every 100 persons employed 36 were losing 13 hours a week by working sort time. This is not a sign of progress. Employment is bad in the paper, printing, and book binding industries and a considerable amount of short time is still being worked. But in the newsprint mills full aime is worked, thanks to the Australian preference for British paper and a good outlook.

Rubber in Paper

One of the science experts in the Manchester College of Technology, Mr. Frederick Kaye, contributes an article to one of the daily papers on his process for adding rubber latex in the manufacture of paper. (This subject was discussed in the Pulp and Paper Magazine for March 30.)

The Wages Conference

"No news is good news", is an old adage, and in the absence of any statement on the conference of employers and employees over wages and hours in the paper mills, we are at liberty to assume that everything is sailing along peacefully so far. There is a ballot, of course, to be taken on some points raised in the conference and no doubt that accounts for the reticence on both sides. I feel, however, that a satisfactory adjustment will be reached.

Imports of Boards

During February 2,688 tons of strawboard was imported by the United Kingdom in all ports, the supplies coming from Holland, Germany and Belgium—in the two latter cases the shipments were very small — and the value is put at £23,754, which works out roughly a $40 a ton.

Millboards were imported as follows:—Canada 145 tons, 2 cwts; Germany, 186 tons 17 cwts; U. S. A. 168 tons, 19 cwts; Sweden 329¼ tons; Netherlands 1¼ tons; Finland, 17 2/3 tons; Denmark 2 tons, 4 cwts; Belgium, 14¼ tons; Norway, 51 tons, 17 cwts—a total of 929½ tons, valued at £22,332.

Cardboard supplies were received on February from Norway, Germany, Sweden, Netherland, and Austria, amounting to 357 tons 6 cwts., valued at £15,784 and heatherboards arrived from Germany, Finland, Norway, and U. S. A. to the extent of 62 tons 4 cwts valued at £1,038. It will be noticed Canada shipped no cardboard to England in February.

Pulp Market

No change to report. Groundwood is beginning to change hands, but at no reduced prices.

Shipments of unbleached sulphite and groundwood have arrived from Canada for Becker and Co. Ltd.

UNITED STATES NOTES

President Harding has issued a proclamation naming April 22 as a golden anniversary of Arbor Day. Officers of public instruction and of civic and commercial organizations are urged by the president "to unite in thought and action for the preservation of our common heritage by planning such educational and instructive exercises as shall bring before the people the disastrous effects of the present waste by forest fires and the need of individual and collective efforts to conserve the forests and increase our tree growth for ornament and use."

President Norbert A. Considine of the Paper House of Pennsylvania returned to Philadelphia recently following a tour through the Southern States. He made a special study of the import printing paper sales field. He found general conditions in the South on the upgrade, that ocean freights through Southern ports like New Orleans were advantageous and that at the present time a very large amount of foreign made newspaper was being consumed. As the result of Mr. Considine's investigations, the Paper House of Pennsylvania may open a Southern branch at an early date.

The Julius Seidel Lumber Company, St. Louis, Mo., has added a building paper department intended to serve St. Louis and vicinity with quick deliveries and shipments of such commodities as wall board, roofings, waterproof and insulating papers, sheathings, etc. The new department will be under the direction of Claude L. Dann, formerly manager of the building materials department of the Graham Paper Company, and until recently district manager in St. Louis for the Beaver Board Companies.

Robert R. Drummond, Philadelphia salesman for the Seaman Paper Company has resigned from that firm to take the place as purchasing agent with the Oxford Paper Company in New York City. Prior to taking up his new duties, Mr. Drummond spent some time at the Rumford Mills in Maine in order to become familiar with the manufacturing end of the business.

The reorganization managers of the Beaver Board Companies have announced that it has been impossible to complete the proposed plan of readjustment of the indebtedness by April 1 as contemplated, and that the committee representing creditors holding maturing obligations have requested an extension until April 29. More than three-fourths of the creditors have assented. Sufficient deposit of 8 per cent. gold notes and stock has not been received to make possible the completion of the plan. If such deposit is not obtained a receivership will be necessary, the managers' statement sets forth.

The Springfield *Union* has reduced the price of its daily issue from two cents to one cent. The *Evening Union*, which has been selling for two cents, also has been cut to one cent.

The Weis Fiber Container Corporation factory at Monroe, Mich. was destroyed by fire on April 2nd, causing a loss estimated at $1,000,000.

"Critical Points in Pulp and Paper-making," is the title of a booklet published by the Bird Machine Company, South Walpole, Mass. It contains information regarding the application of the company's products in the manufacture of pulp and paper, and should be of much interest to the trade.

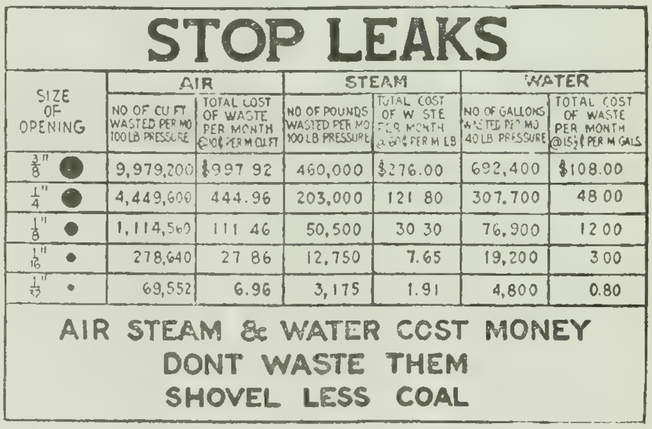
A forest conservation play, in which O. M. Porter, secretary-treasurer of the Woodlands Section of the American Paper and Pulp Association will take a leading part, will be given in New York City in connection with the observance of conservation week late this month. The play will be put on at the Selwyn Theatre, and will be given under the auspices of the New York Federation of Women's Clubs.

Sloan's School, Indianapolis, will be the scene in the near future of a paper-making exhibit to be staged under direction of the American Paper and Pulp Association.

A celluloid slide rule box board guage that is probably the only guage of its kind ever produced is being distributed by the C. L. LaBoiteaux Company to its clientele. It is simple in operation and should be of considerable service to paper box manufacturers.

STOP THE LEAKS

A very striking poster is displayed in conspicuous places by the Rock Island Railroad system. The possible loss in air, steam and water systems is illustrated in an impressive manner. The volume lost under different conditions is computed and converted into dollars and cents to emphasize the importance of repairing any small leaks, as shown below:



STOP LEAKS

SIZE OF OPENING	AIR		STEAM		WATER	
	NO OF CU FT WASTED PER MO 100 LB PRESSURE	TOTAL COST OF WASTE PER MONTH @10¢ PER M CU FT	NO OF POUNDS WASTED PER MO 100 LB PRESSURE	TOTAL COST OF WASTE PER MONTH @60¢ PER M LB	NO OF GALLONS WASTED PER MO 40 LB PRESSURE	TOTAL COST OF WASTE PER MONTH @15½¢ PER M GALS
3/8" ●	9,979,200	$997 92	460,000	$276.00	692,400	$108.00
1/4" ●	4,449,600	444.96	203,000	121 80	307.700	48 00
1/8" ●	1,114,560	111 46	50,500	30 30	76,900	12 00
1/16" ●	278,640	27 86	12,750	7.65	19,200	3 00
1/32" ●	69,552	6.96	3,175	1.91	4,800	0.80

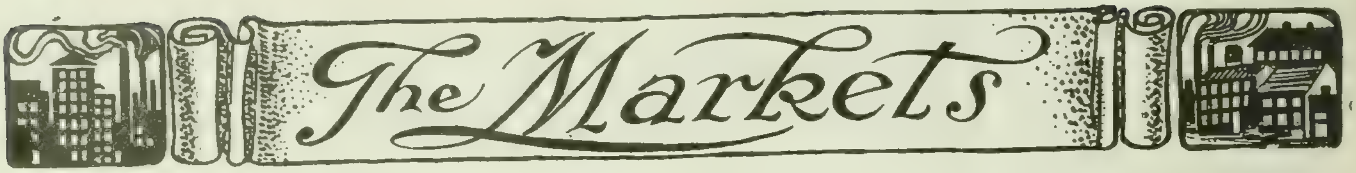
AIR STEAM & WATER COST MONEY
DONT WASTE THEM
SHOVEL LESS COAL

There is often a tendency in paper mills to overlook unnecessary waste of water or a leaky steam valve because of the large volume of water and steam used. A similar "Stop Leak" sign worked out for pulp and paper mill conditions should be of great value. A poster of this type shows the workmen what financial loss may be incurred because of a leak that can be easily detected and repaired.

MEETING OF BONDHOLDERS OF CLARKE BROTHERS LTD.

A meeting of bondholders of Clarke Brothers Ltd., Bear River, N. S. has been called for 25th April to vote upon a proposal to create a seven percent prior lien fifteen year gold bond to the amount of $600,000 to meet maturing obligations and provide working capital to reopen plant and construct a pipe line to secure a permanent supply of water by gravity. The failure of water supply due to unusual drought caused the present shut down of plant.

The output of the firm being contracted for, it is felt that all obligations can be met satisfactorily if the above arrangements can be carried out.



NEW YORK MARKETS

New York, April 8. — (Special Correspondence). — Judging from most of the reports received from jobbers in localized consuming centres, one would infer that the paper industry continues to be characterized by profound quietness. Jobbers and mill agents in general state that demand for paper of practically all kinds in narrow, that consumers cannot be prevailed upon to buy other than in hand-to-mouth fashion, and that the volume of paper moving toward consumption is nowhere near what it should be. On the other hand, reports coming from manufacturing centres are much more encouraging. Paper mills in various parts of the country are said to be quickening their operations, increasing their production, and to be finding an outlet for their product with far less difficulty than in some time. This difference in the character of reports indicates that there is a much larger movement of paper than many in the trade are willing to admit; that a much greater amount of paper is being produced and consumed at present than local conditions in New York and the other principal consuming centres would suggest. Not that paper jobbers and merchants are disposed to take a bearish view of the situation; instead there is a very optimistic feeling pervading the trade and nearly everyone endeavors to be as encouraged as they can, but it appears that the average distributor of paper is not inclined to view the situation as broadly as he should, with the result that, looking at the subject from a narrow viewpoint, he does not realize how matters really are improving.

Certainly the figures contained in the latest Federal Trade Commission's report show that the paper industry is maintaining its productive activity on a fairly large scale. Production of paper in February was only slightly below that of the preceding month, amounting to a total of 501,817 net tons of paper of all kinds in February compared with 506,195 tons in January, and being well above the average monthly output based on the Commission's reports for the last five years of 463,841 net tons. These production figures are especially encouraging when it is considered that February is a short month with several generally observed holidays.

It is also quite likely that many members of the trade base their opinions regarding the present market condition largely on the price situation, in which event they would naturally acquire a somewhat pessimistic view of the present standing of the industry. There is no question but that prices on many kinds of paper are too low. Competition among those seeking orders has forced prices down to a point where paper in frequent cases is being marketed at levels where manufacturers and jobbers are realizing little or not profit. This is not a healthy condition, to be sure, and it is obvious that as mills procure more business and become better engaged they will adjust prices on a sounder basis.

Newsprint continues to move in a fairly consistent manner and at steady prices. Opinion is general that print paper prices have struck bottom and belief on this score is reflected in the freer buying operations of publishers who are absorbing supplies in larger volume than in many a month. Latest statistics show that newspaper circulation is growing and that publishers are printing larger issues to carry the increased advertising they are obtaining, which are encouraging factors in that they mean heavier consumption of newsprint.

There is a better demand for book papers. Orders are mostly for limited tonnage which does not measure up to nomal, but in the aggregate the movement of book paper is on the rise. Quotations show a hardening tendency and mills are gradually getting into a more independent position and therefore are enabled to refuse orders which fail to net them a profit on their product. Wrapping papers are in moderate demand notwithstanding that large importations of Scandinavian kraft wrapping paper are having a bad influence on the market in the United States. Tissues are exhibiting a firmer price tone under a better demand from consumers, and fine papers are wanted in more numerous lots with quotations, particularly on the higher grades of bonds and ledgers, tending firmer.

The box board market is livelier than it has been in a long time, and reports say that a majority of board mills have sufficient orders booked to keep them fully engaged for a month or longer. Quotations on board hold steady at from $35 upwards a ton f.o.b. New York on plain chip, and between $37.50 and $40 on filled news board.

GROUND WOOD.—While the situation in ground wood displays a little easier tone, evidently due to the fact that grinding mills now have plenty of water and therefore are enabled to increase their production, no material changes have occurred in prices. Manufacturers continue to quote at about previous levels and seem to be getting enough orders for their product to warrant the maintenance of prices. Domestic grinders in Upper New York State and New England quote anywhere from $30 to $35 a ton f.o.b. producing plants, depending on the quality of pulp and the distance it has to be hauled to consuming mills, average prices delivered consuming points ranging around $40 a ton. Additional sales of ground wood brought down to New York from Nova Scotia by schooners at around $34 a ton f.o.b this city are reported, indicating that prices in this branch of the trade also are holding. Some U. S. consumers are reported buying ground wood in Canada down as low as $27 per ton at grinding plants but the heavy freight brings the delivered cost up to the same level at which domestic pulp is quoted.

CHEMICAL PULP—Most members of the trade in New York describe the chemical pulp market as quiet and say that quotations tend lower, yet concrete proof of price declines is lacking. It is clearly apparent that consumers are buying cautiously; that is, that they are placing orders only when in direct need of supplies, nevertheless the sales recorded indicate prices are fairly well maintained and that, everything considered, a moderate movement of pulp is in motion. It is also to be noted that, relatively speaking, imported pulp is selling more readily at present than domestic, which is to be expected when it is understood that importers in frequent cases are quoting proportionately cheaper prices.

Late authoritative advices of a definite nature from Washington are to the effect that a 5 per cent duty will be imposed on chemical wood pulp in the new permanent tariff bill, to be figured on an ad valorem basis on the American valuation plan. It is also stated that the probabilities are pulp will be put back on the free list before the tariff bill becomes law; at least, there is a strong feeling in the trade here that pulp will not remain on the dutiable list.

RAGS.—The papermaking rag market continues dull. Sales are scattered and seldom involve important amounts of rags, as consumers are buying merely to fill immediate requirements. Some grades are moving so slowly that hardly any market exists for them, while even those kinds of rags finding an outlet are bringing low prices over which dealers express much dissatisfaction. Roofing stock is probably moving in proportionately larger volume than any other class of rags, and felt mills seem to be having no trouble procuring No. 1 packing of roofing at 90 to 95 cents a hundred pounds f.o.b. shipping points, and No. 2 packing at 80 to 85 cents. In some cases foreign dark cottons are selling at $1 a hundred pounds, but more often these rags are fetching no higher than 95 cents. Old whites and blues are in slack demand, and new cuttings are wanted in but small quantities. No. 1 white shirt cuttings are quoted at around 10 cents a pound at dealers' points, new unbleached muslins at 8.50 cents, white lawns at 8.25 cents, blue overall cuttings at 5.50 cents, and new No. 1 washables at 3.75 cents.

PAPER STOCK.—Several grades of old paper are selling rather freely provided dealers are willing to accept the prices offered by mills. No. 1 soft white shavings are in comparatively good demand at around 3.15 cents a pound f.o.b. New York, white blank news cuttings find ready buyers at 1.65 cents, and old No. 1 mixed paper for board mills is moving in fair tonnage at 45 to 50 cents a hundred pounds. On the whole, however, there is not the activity in the market that ordinarily exists. Mill demand does not begin to measure up to what it usually is at this time of the year, and indications are prices would go lower were they not already on such low levels. Folded newspapers are quoted at 55 to 60 cents a hundred pounds at dealers' points, old No. 1 kraft at 1.75 cents per pound, old books and magazines at around 1.40 cents, and No. 1 hard white shavings at an average of 3.75 cents.

OLD ROPE AND BAGGING. — Prices on old rope and bagging rule about steady under a more or less routine movement of these materials. Domestic manila rope in No. 1 condition sells at 4.25 cents per pound at dealers' points, and No. 1 scrap bagging at one cent a pound, though some dealers putting up a special packing of bagging report receiving 1.25 cents.

DISCUSSING PLANS FOR WATER POWERS

Toronto, April 6.—The series of conferences now in progress in this city between members of the T. & N.O. Railway Commission, officials of the Hollinger Mine and the Abitibi Power & Paper Co. have for object the formulating of a policy regarding the development of the huge water powers of the Abitibi River, whereby electric energy might be turned to the services of these three great corportions and, at the same time, provide a surplus for industries of the north country.

Any injury that breaks the skin demands first aid treatment.—Give yourself a fair show.

CANADIAN TRADE CONDITIONS

Montreal, April 10.—General business conditions are the vital factors in the dullness or activity of the pulp and paper trades. While commence has not improved to the extent hoped for, it is on the up-grade, and the pulp and paper industries have shared in that slight revival—in fact it has participated to a greater extent than some other basic industries. The activity in pulp and paper stocks and shares is not to be overlooked in this connection. Part of the large turnover and the rise in values is undoubtedly due to pure speculation, but a portion may be fairly attributed to a belief on the part of the public that the pulp and paper trades are now in a more satisfactory position from the revenue point of view, and that the prospects are more favorable. The fact that three companies are in the market for additional capital is significant. Even nine months ago these appeals would have been out of the question.

The newsprint situation has apprecially improved. Mr. A. L. Dawe, the assistant manager of the Canadian Export Paper Co., Ltd., is quite optimistic as to the outlook. He recently returned from a month's visit to many of the principal cities of the United States, including Baltimore, Chicago, Cincinnati, Buffalo, Cleveland, Detroit, and Toledo. He stated that general business conditions are picking up. In the Southern towns and cities the depression had not been so intensified; the publishers received a fair amount of advertising and money was spent more freely. In Detroit, Cleveland and the surrounding districts the slump had been heavy. The automobile trade had suffered, and the companies had reduced the number employed and speeded up production from these who were kept on. The view taken was that while trade was dull, there was no actual danger of collapse as was feared several months ago. From the publising point, while advertising was about 8 or 9 per cent lower as compared with last year, great efforts were being made to increase the circulation, and in order to obtain results, many new-features were added, naturally increasing the use of newsprint. The consumption of paper in the United States was at a higher point than at any previous period. It might be asked that if this had been the case, why were the Canadian mills not more fully employed? The answer was— the imports form Europe were heavier than for many years, and affected the mills of Canada and the United States; in other word, European manufacturers supplied a share of the requirements, at the expense of Canada and United States. Since the beginning of the year there had been a change in the situation. European paper was found to be unsatisfactory for the average North American newspaper. Wherever one went he found people with stocks of foreign newsprint, bought at low prices, but which in reality was not cheap at any price. It was too transparent, too thin, and would not stand up against the terrific strain of the modern american printing press. Mr. Dawe declared, "Take any foreign paper and put it against any Canadian paper, and the difference is obvious even to a layman." In Europe there were no page advertisements as here, and the necessity for paper being opaque was not a vital as on this continent. The result was that purchasers who bought foreign paper were returning to Canadian mills, all of which were sold up for the next two or three months. Certain publishers anticipated a drop in price and allowed their stocks to decrease; these publishers are now compelled to go into the market and fill their requirements. The Export Company felt that prices would remain stationary for some time; an increase was not likely, and certainly a decrease was not anticipated. Mr. Dawe added that the growth of radio telegraphy in the states was responsible for an appreciable increase in the use of paper, some of the dailies publishing a special radio page.

Book and fine papers are in moderate demand, although the orders are mainly of the immediate delivery character. Coated stock is dull. Tissues and toilets are spotty while wrappings meet with a fair sale.

Pulpwood is almost dead, and the outlook is not good. The pulp market, as a whole, is quiet. Groundwood is unattractive in price from the point of the producer, so that very little surplus is being made. Bleached sulphite holds firm at current prices. The sales have steadily increased since the beginning of the year, but the demand still leaves something to be desired.

TORONTO NOTES

That financial confidence is being restored in the Pulp and Paper Industry as an investment medium is shown by the fact that paper, pulp and board mills are inviting market attention to offerings of bonds, stocks and debentures. The industry thus shows confidence in itself and the manner in which the offerings are being met indicates that the public is feeling renewed confidence in the industry. This also shows in the marked rise of some stock issues. We are not yet out of the woods of readjustment, but careful analysis of the situation shows that wherever possible, what might be called the invisible assets are being discarded and there is some house-cleaning in the inventory cubicles.

As far as general business is concerned, pulp and paper activities follow closely those of textiles, retail drygoods, building trades or anything else. When one seeks inspiration he experiences much the same sensations as listening to an anthem by a rural choir, there are many repetitions and it's hard to say whether the next burst will be Amen, or Hallelujah. One man said he felt like saying hallelujah, and would do so under ordinary circumstances, but didn't feel quite sure of his ground.

On all sides it is felt that matters are steadily improving, but that the inertia to be overcome was so great that strenuous endeavour seemed to do little more than prevent a fall back. The most helpful factor is the sense that continued effort is counting and that the circumstances of consumption and lapse of time are both in favor of increased business.

The situation is reviewed in the following notes:

PULPWOOD.—Our predictions of some weeks ago as to possible shortage of pulpwood in the fall and winter of 1922-23 are corroborated by reports from Parry Sound that the cut has been light in that district. In isolated districts settlers have made good cuts, but lack of capital and small demand has had a retarding effect.

GROUNDWOOD.—News grade $30 to $35 delivered, book $37 to $40 delivered.

SULPHITE.—News grade $60 to $65. Book $65 to $70. Market inclined to be quiet.

KRAFT.—The market seems stabilized at a price of $70.

WRITINGS.—Fairly active.

BOOK.—Mills running about 80 p.c. capacity with fair business.

BRISTOL, COVERS and TAGS.—This week's business is not quite as brisk as last, but still active, and mills are figuring pretty closely. The demand for tags reflects activity in building, hardware and automative trades.

WRAPPINGS.—No. 1 Kraft 8¾c. per lb. Colored Kraft 9¼c to 10¼c. per lb. Manilla 5¼c. to 7½c. per lb.

BAGS.—Manilla, 65 per cent off regular list prices. Light Kraft 65 per cent. Heavy Kraft 70 per cent. White Bond 45-10, 10 per cent.

TISSUES and TOILETS.

Manilla	20 x 30	$ .85	24 x 36	$1.15 Rm.
Nat. White . . .	20 x 30	.95	24 x 36	1.35 Rm.
No. 1 White . .	20 x 30	1.25	24 x 36	1.75 Rm.
White Sulphite	20 x 30	1.10	24 x 36	1.55 Rm.

TOWELS.—Interfolding $5.50 per case. I.X.L. Roll $15.25 per case less 22 per cent.

Trading in waste paper showed no important change either in demand or price during the past week. There has been a moderate movement for mixed papers while demand for books and magazines continues firm. General market conditions are not as satisfactory as they were last week, although this condition is looked on as only temporary.

Cotton rags still continue slow, and scattered sales to mills indicate a merely nominal market. Roofing rags are moving in limited quantities and mill demand lacked snap.

Paper manufacturers for the most part showed little disposition to stock up in new cotton cuttings, and prices are in a very uncertain position. All quotations given constituting approximate market levels.

FIFTY YEARS AGO!

Toronto printers are threatening to strike. If they do newspaper publishers and other master printers will declare for the open shop.

(From the Globe, March 28, 1872.)

Scandinavian American Trading Co.

50 E. 42nd STREET TELEPHONES 8311 8312 8313 MURRAY HILL **NEW YORK**

We are always in the market and ready to pay good prices for **SULPHITES** Bleached and unbleache of Canadian manufacture Write and let us show you what we can do.

HANS LAGERLOEF, President and Treasurer
ORVAN HYLIN, Vice President
MAURICE LONDON, Secretary

TRADE HL MARK

Lagerloef Trading Co., Inc.

52 Vanderbilt Avenue
NEW YORK, N. Y.

Telephones
Murray Hill 4246 / 4247

WOOD PULP

SOLE AGENTS IN U. S. A., CANADA, MEXICO AND CUBA FOR

Finnish Cellulose Association
Helsingfors, Finland

AND

Finnish Wood Pulp Union
Helsinfors, Finland

PAPER SECURITIES IN DEMAND.

One of the features of the market during the present movement has been the action of the paper stocks, especially those of promise now quoted at the lower levels. There has been a marked improvement in sentiment with regard to these shares and their action, at no time sensational in the recent upturn, has been accelerated to a considerable extent by buying from the west, presumably for traders who had gone short. The following table gives the performance of active paper stocks last week and a comparison of the heights attained by them during the boom of 1920., the nervous days of 1921, and what appears to be their entry into a new era in 1922.

Stocks	Last Sale	Net ch'ge	High 1922	High 1921	High 1920
Abitibi	47	+5½	47	57¾	87
Brompton . . .	26	+2	26½	57¼	85
H. Smith	65	unch	74	110	167
Laurentide . . .	85	+2½	85½	95	125
Price Bros. . . .	43¼	+5½	44	42¼	385
Riordon	9	+1	9¾	160	226
Spanish R. . . .	*72¼	+4	73½	*89½	125¼
Do. pfd.	*84⅞	+1⅝	86⅛	95	149
Wayagamack . .	37½	+1½	38½	89	150¼

It must be taken into consideration, of course, that a share of some of the above issues represents from 2 to 5 shares of old stock, the majority of such splits having been made in 1920.

INCONSISTENT POLICY

The Wall Street Journal in a strong editorial points out the inconsistency of the high tariff advocates at Washington so far as the effects of their proposals upon trade with Canada go.

"It seems as if every product of Canada must be taxed to a prohibitive point," says the paper. "That country is comparatively new and must buy large quantities of manufactured goods, which are to be paid for with farm products. There is only one other country in the world that buys so much from the United States. And yet, we are aiming to treat this important customer in a way no merchant with a modicum of common sense would treat one of his customers. Markets are as essential for farm prosperity as for that of industry. But those who would sell must also buy. We cannot forbid everyone to come into our domain, and at the same time ask them to buy, and buy heavily of us. Human nature must be made over before Congress can take everything and give nothing.

"In all probability the list will become law. It will be well for the farmers to check it up a year or two hence to see whether it has been a tonic or a habit-forming drug."

KAMINISTIQUIA MILL TO START SOON

All litigation proceedings, injunctions and delays in connection with the plant of the Kaministiquia Pulp and Paper Company, Current River, which was purchased on February 20 for $175,000 by George P. Berkley, general manager of the Consolidated Water Power & Paper company, Wisconsin, Wis., are now cleared away, and it is expected that within three weeks' time active operations will be commenced at the mill.

The Consolidated Water Power and Paper company has purchased the Point Magnet limits for $85,000, from the former Kaministiquia Pulp and Paper company. These limits are at the point of the Black Bay peninsula, and comprise, according to the last cruise made, 70,000 cords of spruce, in addition to other timber.

The intake pipe, which is of 24-inch diameter, will be 700 feet long, and will take care of a mill of 100 ton capacity

WAYAGAMACK

Wayagamack P
THREE RIV

WORKS, FROM LOG CONVEYOR

Largest Kraft Mills in the World

EXPORT BALING

WAYA

DIS

Canadian Kraft Lir

WIT

United Kingdom and Fr
Craven House,

Australia:
Parsons Trading Co.
Sydney

United States: The Pulp & Paper Trading Co., New York

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE, P.Q., April 20, 1922. No. 16.

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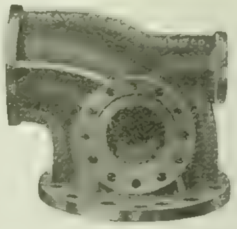

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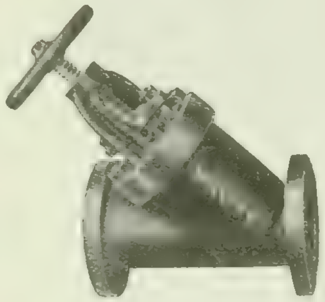


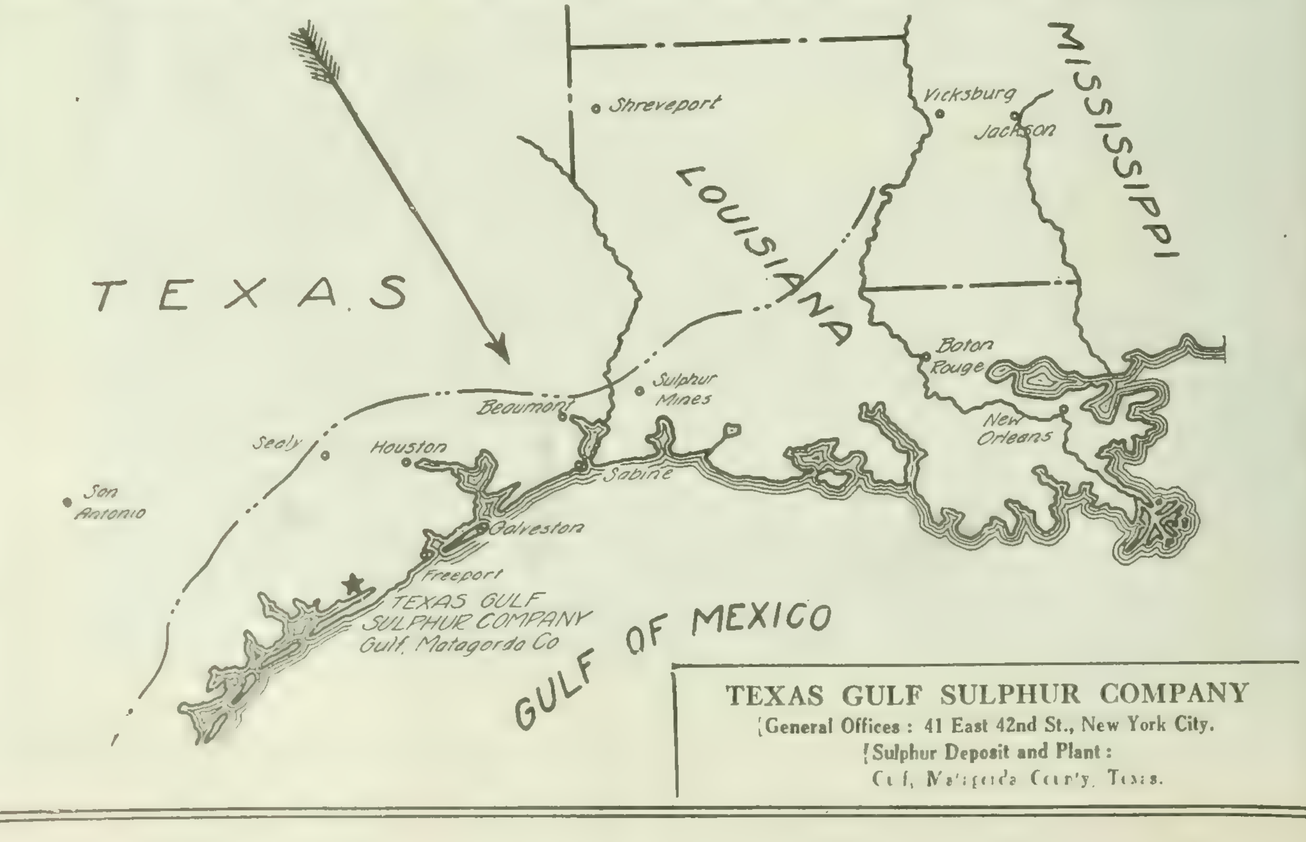
A special feature of our Pulp Mill Work is its complete suitability for the work in hand.

The throats of our Acid Resisting Bronze Valves are thickened and strengthened, also the backs of elbows and places in all fittings where excessive wear makes this thickening necessary, and where its application allows the valve or fitting to render a very much longer life in service.

TRADE MARK WORLD McAVITY'S GUARANTEE

T. McAvity & Sons, Ltd.
Valves Fittings & Supplies
Goods Guaranteed Good by Almost a Century's Experience Estd. 1834
St. John, N.B. Canada.

THIS LINE MARKS THE SOUTHERN LIMIT OF THE GEOLOGICAL FORMATION KNOWN AS THE NEOCENE. THE TERRITORY BETWEEN THIS LINE AND THE GULF COAST IS DOTTED WITH SULPHUR DEPOSITS, THE LARGEST OF WHICH IS THAT OF THE TEXAS GULF SULPHUR COMPANY.



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EDITORIAL

THE AMERICAN CONVENTION

A year ago at this time, the paper makers and pulp manufacturers together with their fellow business men in other lines, were in a position very much like a person who is ready to dive into the water and knows it is going to be cold. Business men could see that they were in for a year of depression and commercial difficulty but could not tell how bad the experience was going to be. To reach better times it was necessary to wade through the slough of despondency. This has been done and on the other side we find ourselves on firmer ground but like the boy who has plunged into the water for his first swim in the spring, a good many are still shivering from the recent experience. It is probable that a large number of pulp and paper makers find themselves better off to-day than they had expected.

The general feeling at the Convention of the American Paper and Pulp Association in New York last week was that the worst had certainly passed although the present is not as prosperous as had been hoped for. There was a distinct feeling of confidence and optimism that the present year, while it will not be a particularly profitable one for all branches of the industry, will at least see the mills breaking even or perhaps doing a little better. No one any longer has a notion that business will come along for simply putting up a "this way please" sign. Business will have to be gone after and dug up. This apparently is not so much because purchasers do not need materials or will not buy supplies as because everyone seems inclined to postpone purchases until the last possible moment and it requires an argument in most cases to convince the customer that now is the acceptable time.

It is obviously impossible to give a complete account of a convention involving meetings of some 20 organizations, but we are able to give a resume of the principal events in this issue and next week we shall print several of the principal addresses. It will be some time before all the addresses are available and it is planned to reproduce a number of the more important papers in subsequent issues.

Of the $101,869,991 assets of the International Paper Co., plants and property are valued at $53,643,645, woodlands at 8,487,773, and inventories at 30,782,154. Some company!

THE TARIFF ON PULP.

Now that income tax returns have been made to their respective Governments, Americans and Canadians are finding the proposed tariff bill as amended by the United States Senate, the principal topic for conversation. Attention was focused on the subject at the time the Fordney bill was discussed in the House and interest has lain dormant only to be revived by the action of the Senate committee which was announced last week. The tariff bill, brought forward by the committee and recommended to the Senate, provides that the foreign value be taken as the first basis of computation unless the President shall have made public a finding as to the American price of a similar article with which the imported article competes. The Senate bill also provides that the President may raise the rate of duty.

The most important feature of the bill as affecting the pulp and paper industry is that newsprint paper is nominally free and mechanical woodpulp, rag pulp and pulpwood are likewise free while chemical pulp, other grades of paper and books are subject to payment of duty. The duty on chemical pulp is 5 per cent. ad valorem, on printing paper not otherwise provided for one fourth of a cent per pound and 10 per cent. a.v.; paper board, etc., and sheathing and roofing paper 10 per cent.; filter stock 1½c per pound and 25 per cent a.v.; tissue and other light weight papers from 4c to 6c per pound according to weight and 15 per cent. a.v.; coated papers 5c per pound for most grades and 20 per cent to 25 per cent additional.

The Senate bill carries the same provision as the Fordney bill with regard to imports of papers and pulp from a country which of itself or by its provinces puts any restrictions or export tax on paper or pulp or on pulpwood. There is no use dwelling on this point except to observe that the wording reads "provided, that *whenever* the President shall ascertain as a fact" that restrictions are in force "he *may* by proclamation declare such ascertainment setting forth the facts; whereupon...there shall be levied...a duty of 10 per cent. ad valorem and in addition thereto an amount equal to the highest export duty or other export charge imposed by the other country." It will be noted that we have emphasized the words "whenever" and "may" intimating that the President is not bound to make any investigation of the matter nor having investigated this point, is he required to make any proclamation with regard to it. It hardly seems necessary therefore, to worry about this particular provision. There is enough to claim the attention of Canadian producers of pulp and paper, especially in the provision of a duty of 5 per cent on imports of chemical wood pulp.

The depression of the past year has created a condition where American pulp mills could furnish an unusually large proportion of the paper makers' requirements simply because the paper mills required little. Thus we are subject to very severe competition for the restricted amount of business available because other countries, particularly in Europe had enormous stocks of pulp on hand and these had to be liquidated at whatever sacrifice. In the face of such competition and with a probable stabilization of pulp manufacturing costs in Scandinavian countries at a level below the reach of the American producer, there seemed nothing to be done but to agitate for an import duty on chemical pulp. It is not entirely surprising that such agitation has not aroused a storm of protest from the paper mills because most of the paper mills themselves desire a rate of duty which in itself provides a very fair profit and which having assured the mill the domestic market in many cases will leave a margin by which to undersell foreign producers in their own country. Thus, to an extent at least, the American purchaser of American pulp and paper is paying a profit on exports of the same material.

It is probable that an important factor in the agitation for a duty on pulp is the increasing cost of pulpwood in most American pulp mill centres. A considerable amount of this wood is brought into the United States from Canada and this competition for Canadian wood automatically increases the value of the supply available to Canadian pulp mills and this raises the cost of the production of their pulp as well. The pulp in turn must be shipped far greater distances by rail to the American paper mill than is the case with the product of the American pulp mill. The amount of freight on this pulp is as much as or greater than the amount of duty which the importer may have to pay on it, all of which will enable the American producer of pulp to obtain a higher price for his product which means that a higher price will have to be paid and this in turn will make it harder for the U. S. mill to compete abroad with paper made from it. The pulp mill normally will not get any more business, because American wood supplies will not justify the production of more pulp. It would seem that, with the dependence of the American pulp mill to such a large extent on imports of Canadian wood pulp an effort would be made to afford some consideration to the fellow producer in Canada rather than to hold an additional sword over his head in the form of the provision for the extra duty which has been referred to.

Without assuming any prerogative, it appears quite plain to us that the 5 per cent duty on pulp is primarily a matter of congressional business while the provision for the Presidential proclamation is distinctly a sword over the heads of the Provincial Governments in Canada to be used as a lever to loosen up restrictions on the export of Canadian pulp wood. The President will doubtless have the good sense to avoid precipitating the storm of difficulties which would surely ensue if the penal duties provided for in the new bill were brought about. We can well imagine what would happen to an administration which deliberately would levy a 10 per cent. duty on half of the newsprint consumed in the United States. Such action would please the newsprint manufacturers all right but it is noticed that such a Presidential proclamation would increase duties on all woodpulp and woodpulp papers, and would thus again increase the cost of making newsprint in the United States.

The promoters of the duty on chemical pulp and those who jockeyed for an advantageous tariff on their own product by not opposing it evidently have overlooked a very important circumstance. Canada imports about $9,000,000 (nine million dollars) worth of paper from the United States. Most of this is made from the grades, even the very pulp, that the new tariff seeks to exclude. The logical thing for the Canadian to do with his pulp is to use it at home and his government can be expected to provide sufficient protection to take care of difficulties inherent in small orders and new industries. Nine million dollars is quite a slice of American exports of paper, and that much kept in Canada will be more than a proportionate benefit to the Dominion.

Reports from Washington indicate that the present session of Congress can hardly be expected to complete the discussions on the tariff bill and permit its becoming a law this summer. This doubtless means that the proposed tariff, if it does become a law, could hardly be effective before the fall and indications are that there will be a number of modifications before the President signs it. In the meantime it seems to us that the best thing for Canadian pulp mills to do is so to establish themselves with their American customers by virtue of the promptness and efficiency of their service that the customer will not be inclined to alter such relations by virtue of any temporary effect of a tariff measure. We say temporary effect because, although for a time there may be some pulp of American production available at somewhat less than the Canadian price plus the duty, yet the history of tariffs predicts that the American producer will soon raise his price to meet that at which the Canadian mill can sell its product in the United States at a profit.

There are two things that would immensely strengthen the position of the Canadian pulp manufacturer. Both of these have been repeatedly advocated and strongly urged by the Pulp and Paper Magazine for a long time. One is that Canadian mills make better provision for continuous supply of wood by taking greater interest in reforestation and woods management and the second is that the Government impose such an export duty on pulp wood as would make possible the reforestation and maintenance of the production of an area equal to that deforested by the cutting of the wood which goes out of the country. We mention the latter particularly at this time in order to make it clear that our advocacy of such a measure is not prompted in any degree by the proposed United States import duty on wood pulp. The American measure is a business proposition and so is this.

COBWEBS

If any of our readers want a chance to get stung on an oil well proposition, we have just been approached by a promoter with a brand new bee in his bonnet.

There were a large number of Canadians at the convention of the American Paper and Pulp Association in New York last week. Some of them were Americans.

Water flows only down hill; trade must flow in two directions. If the United States congress dams the flow south, their people will damn the decreased flow north.

There is a lot connected with the strike of coal miners that we do not understand, but we do appreciate their desire to bring about greater continuity of employment. The seasonal occupation and intermittent employment is the bugbear of the laboring man and one of the greatest problems of industry. The source of the problem and the hope of its solution lie principally with the public. If the miners can bring the public to buy coal regularly, regular production can be accomplished, and other industries may be affected similarly. We hope they succeed in doing so.

Beater Room Hazards*

By Charles Walker, Employment Manager, Eastern Manufacturing Company, Bangor, Me.

The degree of safety attainable in the paper mills of today is dependent upon three things: The Superintendent of the mills, the type of man hired for the beaters, and the safety engineer.

The Superintendent must be heart and soul in favor of safety work so that there will be no opposition to spending the small amount of money necessary to keep a beater room safe. The men selected for beater work must be of a type high enough to appreciate the value of the work we are preaching. The safety engineer must be big enough to put across safety policies in face of severe opposition.

The presence of these three factors will be sufficient to enable the safety engineer to reduce beater room hazards to a minimum and almost to a negative quantity.

Modern Beating Engines Nearly Fool Proof.

You all realize, I think, the present day beating engines are very nearly fool proof. Mr. J. J. Sullivan, who is one of the pioneer paper makers of the country, asserts that he knows of no case where a man has been killed or seriously injured by a beating engine, except when the beater rolls were being removed by repair crews.

Minor dangers are always present, like poor relatives, and it is against these that we safety engineers must be continually fighting. Pulley-driven lines, for instance, must be most carefully guarded; motor driven lines must be ever so carefuly watched for the beater room being more or less wet is a wonderful conductor; one man only should be permitted to wield a fork in cases where shavings or centrifuge is dug from boxes. I bear witness to this fact on the little finger of my right hand.

Another custom formerly practised was that of weighting down the valve when the next beater on the line was being dumped. This should never be done, for in England there was such a case, and the weight went under the roll, the roll jumped off snapping a belt which killed two men.

You should see to it that your stock and machine chests are adequately protected. You should see to it that the covering over them is sufficient to prevent men from falling in. You should be particularly sure that all gears are covered.

Slipping on Wet Floors a Cause of Accidents.

Probably the greatest flaw in the old time beater room is their wooden floors covered with boiler plate in the trucking alleys. I venture to state that there have been more beater room accidents caused by slipping on wet plates, causing ruptures, sprained ankles, and straining of back muscles, than any other cause.

If you are building new beater rooms advocate concrete floors with inlaid steel reinforcements for they will pay for themselves many times over on the insurance rates.

Trucks designed so that leverage is created by two or three men pressing down on the handle in order to raise a platform from the floor should be carefully inspected by a mechanic every few days, for when these handles fly back, as they frequently do, that man who is unfortunately in its path is surely liable to injury and would better be back in the front line trenches, where I hope a good part of you beater men have been.

Some of you are perhaps using electrically driven trucks for the transportation of beater room material. Very little may be done to better this modern phase of trucking except to see that bells are in good conditions and traffic rules are well defined.

Tanks Must Be Guarded.

Elevated tanks of all varieties, such as alum, size, and water containers must be sufficiently guarded by railings, and platforms with toe boards. The ladders leading up to them should be of steel wherever there is no danger of these becoming electrified.

Many strange accidents take place in the beater department of a paper mill, most of them due to carelessness, but the most unique one we have on record is the case of a man who was washing out a beater with a line hose. Now in his enthusiasm to get the beater clean he allowed the end of the hose to get under the beater roll which was running at the time. Inch by inch he contested the destruction of the hose until at last he was pulled from his precarious position on the edge of the beater into two feet of water and if he had not been obliged to strike out with his arms would probably have met the fate of the hose.

---

* Delivered at meeting of the Paper and Pulp Section's Tenth Annual Safety Congress of the National Safety Council, Boston, September 26-30, 1921.

The Best Move for Safety.

Most of you people plan your campaign for getting your policies across, but we have found that the best move for safety lies with the employment manager. That much loved and much hated individual has the power to either make or break safety first, as his poor judgment in hiring men who are unable to comprehend what we are all working for has caused thousands of dollars in accident claims and vice versa.

May I give you just one piece of advice regarding this subject? When you go home make your employment manager hire men who will be safety first men from the time they come to work until the time they go home and you will find that 75 per cent of your troubles will end right there.

Let us all try to have nothing hinder our teaching SAFETY FIRST and ALWAYS to the men under.

American Pulp and Paper Convention

That the business of crape-hanging in the paper industry, at least, is at an end and that the outlook for the immediate future may be regarded as a more hopeful one, was the view generally expressed by leading paper manufacturers and other speakers at the forty-fifth annual meeting of the National Paper Trade Association of ciation and affiliated organizations at the Waldorf-Astoria Hotel in New York City last week. More than 1,500 delegates and members attended and no fewer than 250 of the number were on hand for the nineteenth annual meeting of the Nation Paper Trade Association of the United States.

The dominant note of the meetings is best summed up in the words of W. J. Raybold, President of the American Paper and Pulp Association, who declared that "the trade is optimistic to-day, where a year ago it was just the reverse," and that while "the paper and pulp men have taken heavy losses, business is improving and the outlook is more hopeful than in many months."

In his address delivered at the open meeting held in the Astor Gallery Thursday morning, President Raybold said that the last two years have been the worst years the paper industry has seen in a generation, but since they are now behind us the future may be looked forward to with courage unimpaired. "Our industry," said Mr. Raybold, "has been thoroughly liquidated, both as to costs and selling prices. Stocks are low in the hands of merchants, printers and the public. The mills are receiving orders at the rate of fully 75 per cent of normal capacity, all of which is being consumed. A small movement all along the line to build up stocks would soon put the mills on a 100 per cent basis. This is bound to come in the near future. The public will soon learn that now is the time to buy paper."

Discussing trade associations, a topic also touched upon by several others during the course of the meetings, Mr. Raybold said: "Co-operation of the healthy kind does not destroy healthy competition. On the contrary, it encourages the right kind of competition by giving the business man accurate knowledge of trade conditions. This knowledge he can use for constructive purposes in his business without destroying the business of his neighbor. Large corporations or so-called trusts are manifestations of man's desire to obtain the benefits of co-operation; the practices of some of them may have gone beyond the bounds of good morals or proper legal limits, but this fact of itself is not a valid argument against the principle of co-operation. In my opinion the development of trade organizations along the proper lines has been a great step in advance and points the way toward the proper use of the principles of co-operation in contrast to the old pools and trusts. As the Reserve Bank system, by compelling co-operation among the individual banks, prevented a financial panic, so I believe the national trade associations, by encouraging co-operation among their members, have prevented industrial disaster."

According to Mr. Philip T. Dodge, president of the International Paper Company, who addressed the business meeting when Mr. Raybold had concluded his address, the newsprint industry is passing through the most critical period in its history. Every plant, Mr. Dodge asserted, with the exception of three or four small mills, is losing money because of overproduction. The capacity of the mills, he said, has been increased by 600,000 tons, there being 2,700,000 tons manufactured a year. In 1920, 90,000 tons of paper in excess of the demand was made, because publishers had accumulated stocks. As the situation stands now some mills are operated at about 60 per cent, while others are operated at more than capacity.

Mr. Dodge's address also was marked by a declaration that "cowardly and selfish men" in the paper industry are responsible for overproduction and a consequent loss of money by the makers of print paper. "If the manufacturers had been willing to accept a pro rata share of the business", he said, "there would be an ample supply and all the mills would still be running. Some Canadian mills are now running day and night. The remedy lies in an effort of the manufacturers to ascertain the facts and fix a price paying a resonable return and which would not be unfair to publishers."

"I can see a rift in the clouds, although 130,000 tons of newsprint have been received in the country from foreign markets during the year 1921. These supplies have come from Germany and Scandinavia. The German Government compelled the makers to ship their product abroad in order to collect the export tax. But both in Germany and Scandinavia the wages for the workmen and the demand for paper are increasing, and they will need all they make.

"The evils in the paper industry are due to manufacturers' dishonesty with each other. The practice obtains in the business of making rates and then accepting secret rebates in order to get business. We must insist that our competitors hold out open rates and stick to them."

Of the union situation Mr. Dodge said: "In most of the unionized mills the contract expired last May. I got together sixteen or seventeen of the owners of the large mills, after the labor leaders threatened to demand an increase in wages for the men. Later, sixteen of these mills owners quit me and made an agreement with the union men, accepting a plan of arbitration, which I firmly believe will ultimately result in trouble. To-day our own mills are run on the American plan. We deal directly with our own men. We give them the highest wage, shortest hours, and we are getting larger tonnage per capita than we ever did under union rules. So long as I hold down my chair in this company, no union labor leader will ever put his foot over the threshold in my mills. I'll have no third party sharing control.''

In the principal address at the annual dinner Thursday night, Senator Frank B. Willis of Ohio, expressed the fear that the pulp and paper industry of the United States, if it is permitted to become ambulatory, may walk clear out of the country and across into Canada. The Senator suggested that in so far as economically possible, the industry should be kept at home.

''The latest available data,'' he pointed out, ''shows 718 establishments engaged in the manufacture of pulp and paper or both, with an investment of capital amounting to $550,000,000. These plants employed 90,000 men, paid out $53,000,000 in wages and turned out an annual finished product of $335,000,000.''

It may be observed, the Senator said, that it takes approximately two years' product to equal the fixed investment, indicating a very high investment of capital as compared with other industries, which constitutes one of the serious problems of the business. The turnover is too slow, the dependence on local conditions of timber supply too great and the risk too serious to make investment attractive.

''I saw one paper machine at work in Wisconsin that cost $300,000,'' said Senator Willis. ''Such machinery is too bulky and costly to be moved from place to place and hence a constructive program to supply essential raw material in the immediate vicinity must be adopted.''

It was at this juncture that Senator Willis pointed the warning about the industry's possible migration over into Canada. He then outlined some contemplated legislative remedies.

''Your association has been active and far-sighted in preparing a program'', he said. The plan contemplates national and State legislation looking to surveys and classification of forest lands, both public and private, and appropriations for protection, care and management of forests, and the distribution of forest-planting materials; further appropriations for acquiring by national and State Governments, either by direct purchase or by exchanging timber land for cut-over land, regions suitable for permanent forests; appropriations for tree-planting, research and investigation; revision of the tax laws in the direction of offering an inducement to private forestry, and co-operation between private owners and Government in fire protection.''

Dr. Hugh Baker, executive secretary of the association, reviewing the work of the past year, reported that the activities of the different committees of the association had been greatly extended. As an example of this he cited the case of the joint presentation of briefs on the tariff by all the different groups in the association in place of the separate presentation of past years. Dr. Baker outlined the work of two new services of the association; the Woodlands Section and the Information Service. The latter, he said, had proven at the end of its first year's work its value as an educational adjunct and publicity service for the industry. The Woodlands Section, in charge of O. M. Porter, has made a good start, according to Dr. Baker, in the carrying out of some of its primary objects, particularly in the direction of collecting and disseminating accurate statistics and information regarding the wood situation as it affects the paper industry. A greater interest in the work of these two committees and others was urged upon members of the association by Dr. Baker.

Conditions in the fine paper makers' branch of the industry were discussed following the presentation of Dr. Baker's report, Col. B. A. Franklin of the Strathmore Paper Company, Mittineague, Mass., speaking for the fine paper manufacturers. Col. Franklin asserted that the liquidation of the industry had been complete in all branches except that of the printer and in some cases had gone even too far. In the matter of paper production, he said, labor costs had been reduced 35 per cent. from the peak, while in the job printing offices, where a vast amount of paper is used, they were still 200 per cent over the 1914 scale. To this non-liquidation by the printers, said Mr. Franklin, could be attributed the fact that the liquidation in the paper industry had not been passed on to the ultimate consumer. Mr. Franklin said that in the first quarter of last year the average orders received were 29 per cent of normal, and in the same period of the present year the volume of orders rose to 79 per cent of normal.

Mr. W. J. Raybold, Re-elected President, American Paper and Pulp Associations.

''We will have to get over the drunk of 1920 more thoroughly,'' urged Mr. Franklin, ''our condition is very much like that of a man on the morning after. We must begin to work as our fathers did—as we were beginning to work before the war.''

Figures brought before the convention during the week showed that the liquidation in the paper business had resulted in a loss in one year of about $70,000,000. This amount was about equally divided between losses on pulpwood, of which from five to six million cords are used annually in the country, and pulp, where the yearly consumption amounts to about 1,300,000 tons. This complete liquidation was taken by the manufacturers to mean that now the industry could start on the road back to prosperity with a clean slate.

Among the committee reports presented at the business session Thursday, were those of the Tariff Committee, submitted by Henry W. Stokes, chairman, and the Forestry Committee, read by the chairman of the latter, Mr. George W. Sisson, jr. The tariff committee report told of its activities in connection with the obtaining of paper rates in the Fordney tariff. Mr. Stokes said that the committee had been encouraged in its efforts to have increased the rates afforded in the Fordney Bill — that no objections to its proposed upward revisions in rates on paper and pulp had been offered in the Senate Finance Committee or before the sub-committee of the House Ways and Means Committee.

Mr. Sisson, reporting on the work of the Forestry Committee, sketched the history of the association's legislative program for reforestation. He told of the endeavors to have the forestry policy, as proposed through the Snell bill, enacted into law. This measure, said Mr. Sisson, first introduced in Congress in December 1920, has been consistently supported by practically all interests that have given particular attention to forestry matters. Because of the failure of Congress to act upon it, the bill has been repeatedly re-introduced at each session of Congress since that of the 66th. It is now before the Committee on Agriculture of the House of Representatives. If it is not reported out of this committee Mr. Sisson said, it will be introduced in the next Congress and the fight continued. Members of the association were urged by Mr. Sisson individually to tell their respective members and the members of the Committee on Agriculture that the pulp and paper industry is in earnest about the matter of this legislation; that the problem is a serious one; and that they do not intend to let up until a start has been made toward its accomplishment and that failure to act at this time will but result in new and greater demands for action next time.

The business meeting also heard talks by Grosvenor M. Jones, head of the paper division of the Department of Commerce; J. H. Case, deputy governor of the Federal Reserve Board in New York; Dr. Warren M. Parsons, of Harvard University and L. M. Alexander, National Councillor from the Association to the Chamber of Commerce of the United States.

Mr. Jones told of the work and plans of his division and of the policy of Secretary of Commerce Hoover which contemplates active co-operation with twelve leading industries and trades, the paper and pulp industry being included as one of the main twelve divisions. Mr. Jones' bureau, he said, is being enlarged and will soon have a personnel of five. While its work will continue to consist largely in the gathering and dissimination of reliable information and data about the industry and trade generally, Mr. Jones outlined a further scheme now being started in the division — that of reporting on information of special use to exporters in the trade. It is proposed, he said, to obtain from agencies abroad and from all other possible sources reliable and up-to-the-minute reports on market conditions so that the same may be sent out to interested paper exporters in America, getting to them while the information is still of actual use as a trade accelerator.

Mr. Case, in a short talk, showed how the Federal Reserve System is adapted to aid the business man and the manufacturer. Speaking of how it functioned during the critical war period, Mr. Case said: "I think it is a God-send that we had the Federal Reserve System. I believe that during the war it was the salvation of the country, and I believe that because of it we can never have a currency panic again.

At one of the meetings of the group associations early in the week, it was disclosed that 120 new machines, had been put in operation since the war, increasing the capacity of the industry about 23 per cent. The growth of demand in normal times, it was stated, is about 200,000 tons of paper a year and at this rate to get back to the pre-war basis it would take at least three years presuming no new machines were added. To reach a normal operating basis of 90 per cent capacity would take until 1928, it was said. This meant, it was pointed out, that new uses for paper must be found and new machines and mills discouraged. The latter would be comparatively easy, it was said, as the field, until the normal stage should be reached, would not be attractive either to investor or manufacturer.

As an indication of improved business the Paper Makers' Advertising Club at its luncheon brought out the fact that newspaper and trade paper advertising is increasing rapidly and that the demand for paper for booklets and other forms of advertising is improving.

Lawrence H. Sloan managing editor of the Standard Statistics Service, speaking at the session of the Salesmen's Association, said paper prices are stabilizing and beginning to move up. "Salesmen," he said, "are in a peculiarly happy position to help in the battle against hard times. One of the surest ways to cure the situation is through the dissemination of correct information about business among all business men. I fancy also that advertising will have something to do with the process of straightening out the crooked business curves. I am certain that good salesmanship will have a great deal to do with it."

At the meeting of the Woodland Section, Ellwood Wilson of Laurentide Company, Ltd., and T. Coolidge, consulting forester of Bangor, Maine, declared that the commercial reforestation by the paper companies had proved a financial success. They showed that reforestation could be done at an average cost of about $10 an acre with trees planted from twelve to seventeen hundred per acre. Mr. Wilson said that his company is operating its own nurseries and had planted approximately 2000 acres, or somewhat more than 2,000,000 trees. Both speakers pointed out that the paper industry is the greatest reforestation industry in the country at the present time.

At the opening of the session, O. M. Porter, secretary, called attention to the report of the Minister of Lands and Mines in New Brunswick, in which he said that the loss of timber in that province, due to spruce but worm, amounted to $19,500,000 last year. The same loss in terms of feet of timber was 4,000,000,000 feet of fir, and 360,000,00 feet of spruce. Mr. Porter said that the pest is extending into sections of Maine, and he pointed out the great necessity for successful control of its depredation. He also gave figures as to the amount of pulpwood cut during the past season, which he said was only 28 per cent of normal. Mr. Porter explained this small cut as being due to the large stock held over from past years.

The use of tractors and power saws in the woods in order to save manual labor was discussed by George H. Anson of the Abitibi Power and Paper Company. The remaining discussion of the session was devoted primarily to matters of cost in the woods operations.

O. B. Towne, secretary of the Wax Paper Manufacturers' Association declared at the meeting of that group that the business depression especially in New England and New York, where there is a large foreign element, had caused the poorer people to revert to the cheaper European style of living with dried vegetables taking the place of bread in their diet. As a result of these economies, the business of the wax paper manufacturers, who produce the paper coverings for the loaves, had fallen off very sharply. Mr. Towne saw indications, however, of recovery in the industry in other directions, notably in the demand for waxed paper needed for the Easter candy business, and in the vegetable parchment business which largely supplies the paper used to wrap greasy articles, such as meat, butter, etc.

The convention closed Friday with the meetings of the Tissue Paper Manufacturers' Association and the Toilet Paper Converters' Association. Both of the groups reported an encouraging outlook for the coming year. 60 delegates were in attendance.

Election of Officers

The following were elected officers of the American Paper and Pulp Association for the ensuing year:

President, Walter J. Raybold of the B. D. Rising Company; Vice-President for the East, H. W. Stokes, York Haven Paper Company, Philadelphia; Vice-President for the West, A. L. Pratt, Allied Paper Mills, Kalamazoo, Mich. Dr. Hugh P. Baker, will continue as executive secretary. The Executive Committee consists of the Presidents of the twenty affiliated associations and three elected Members-at-Large who are: Col. W. E. Haskell and Sidney Mitchell of New York and Louis Bloch of San Francisco.

Elections held by affiliated organizations resulted in the following selections: Pulp Manufacturers' Association, Thos. W. Ross, Hopewell, Pa. President; H. H. Bishop, New York, Secretary-Treasurer. Waxed Paper Manufacturers' Association, C. A. Buskirk, Otsego, Mich., President, J. W. Hurlburt, Bennington, Vt., Vice-President; Card Board Manufacturers' Association, G. Frank Merriam, Springfield, Mass. President; J. A. Lowe, Fitchburg, Mass., Vice-President; H. W. Sutor, Hamilton, O., Treasurer; O. M. Porter, New York, Secretary. Gummed Paper Manufacturers, C. H. Crowell, Brooklyn, President; Phillips Kimball, New York, Vice-President; O. M. Porter, New York, Secretary-Treasurer. Glazed and Fancy Paper Manufacturers' Association, W. H. Stuart, Springfield, Mass., President; N. N. Fowler, Holyoke, Mass., Vice-President; O. M. Porter, New York, Secretary; G. Frank Merriam, treasurer. Tissue Paper Association, John Brennan, Fulton, N.Y., President; A. H. Scott, Chester, Pa., Vice-President; E. H. Naylor, New York, Secretary-Treasurer. Toilet Paper Converters' Association, L. C. Jeffries, Richmond, Va., President; F. H. Yulke, New York, Vice-President; E. H. Naylor, New York, Secretary-Treasurer.

The Fourth Fall Business Conference of the American Paper and Pulp Association, it was announced in the report of Dr. Baker, will be held in Chicago on October 19, 1922.

The Technical Association

The meetings of the Technical Association were very well attended and we have never been at a convention where the papers offered for discussion were printed and distributed in better shape. Nearly all of the important addresses were pre-printed and distributed to members.

The plan of sectional meetings which was inaugurated a year ago was continued again this year and while a certain amount of overlapping could not be avoided due to the wide interest of some members in several subjects, yet the plan for so large a convention has much to commend it. It was interesting to note that a number of these sectional meetings were continued through more than one session and if all of them got down to brass tacks and stayed there as well as those visited by the editor, a lot of good solid progressive work was accomplished. Any mill manager or other official who says the organizations of the technical men and foresters are not contributing in an important way to economic and profitable production, simply does not know what he is talking about. If these organizations are not contributing to the profits of his particular mill we venture to assert that it is because he does not give the technical men the proper apportunity and encouragement or does not see that the technical information available is properly made use of.

The papers and discussions of the Technical Association meeting are to be reprinted in book form and these should be in the possession of every executive and technical man in the industry. Reviews of the papers will be published later on our abstracts page and a few of the addresses will be printed at greater length.

BOOK REVIEW

Michigan Pine Timber. By Harold Titus. Boston: Small, Maynard & Company; Toronto: McClelland & Stewart, Limited.

This is a more than usually readable story. The scene is in the Michigan timber country, after the lumber men had cut it over. The chief character is old Luke Taylor, who had been a great lumberman, but only thought of the forest as something out of which to make money. He has a son, John, whom he has educated, but half despises. He has a secretary, Rowe, who dislikes John and hopes to supplant him in the old man's will, as in the affections of Marcia Murray. John is offered a chance to show what is in him in getting out some hard wood from a limit old Luke owns. On his way into the woods, he comes to Foraker's Folly, the name given by the neighbors to a tract bought by a man who early had the idea of maintaining the forest as a perpetual source of wealth, had spent time, study and money on the work and had been rewarded with the promise of success. After his death his daughter Helen kept up the effort. Her affairs are reaching a crisis when John Taylor arrives, to become her friend, though at first it does not seem that he is a friend. The sharpers and crooks of the region figure in the record, including the land sharks who sell to uninformed people and then fleece them. Some of their victims appear also. There are those who want Foraker's Folly for the timber it carries, and a crooked lot of municipal councillors are ready to help their schemes. Old Luke hears of the timber and comes to see it after he had refused to hep Helen, whose ideas he calls "moonshine." Seeing, he is convinced and provides the needed money to carry on. There is a fight in which John Taylor spoils Rowe's face as well as his plans, the chief land agent is killed by one of his maddened victims and some others get what they deserve. A vivid description of a fire in the forest and the way in which it was fought is effective. The lesson of the value of its forests to a country and of the wisdom of the "cranks" who first strove to teach the public are well brought out, before the usual happy ending is reached. — The Gazette.

FORESTRY STUDENTS TO GO INTO BUSH

An opportunity of gaining practical knowledge of forestry work will be extended to students of forestry schools next summer through the co-operation of the Department of Lands and Forests here and the Forestry Branch in Ottawa. Expenses will be paid with salaries varying from $70 to $100 a month according to experience. Two parties are now being organized respectively for Lake Edward and Petawawa, Ont., from the 1st of June to the 1st of September. Applications for these expeditions are being received by H. H. Campbell, Director of the Forestry Department, Ottawa.

PAPER MACHINE WIRE PRICES

The Armstrong Bureau of Reated Industries for its clients, the manufacturers of paper machine wires, furnishes for publication the folowing prevailing market price information on brass Fourdrinier wires (new standard) as last quoted to the trade by the respective sellers and cleared through the Bureau:

	Price per sq. ft.
No. 60 mesh	50c — 51c
No. 65 mesh	52c — 53c
No. 70 mesh	56c — 57c
No. 75 mesh	61c — 62c
No. 80 mesh	61c

Transactions of the Technical Section.

Discnssiou of Papers at Annual Meeting

(Continued from last issue.)

THE MANUFACTURE OF WOOLLEN PRESS FELTS

MR. CARRUTHERS: The first paper to be read is one by Mr. E. S. Bates on "The Manufacture of Woollen Press Felts". Mr. Bates will illustrate his paper with slides. He has had correspondence with other felt manufacturers in Canada and there are representatives from various felt manufacturers to help out with any details in regard to the manufacture of felt and to give any information that may be required. I have very much pleasure in asking Mr. Bates to proceed with his paper.

MR. E. S. BATES of Bates and Innes Limited, presented the following paper:

"The Manufacture of Woollen Press Felts. This was published in the Pulp and Paper Magazine on January 20, 1922. The illustrations were not then available.

Photographs are by Mr. Hazen of Milton Hersey Co., Montreal.

The following dicussion took place:

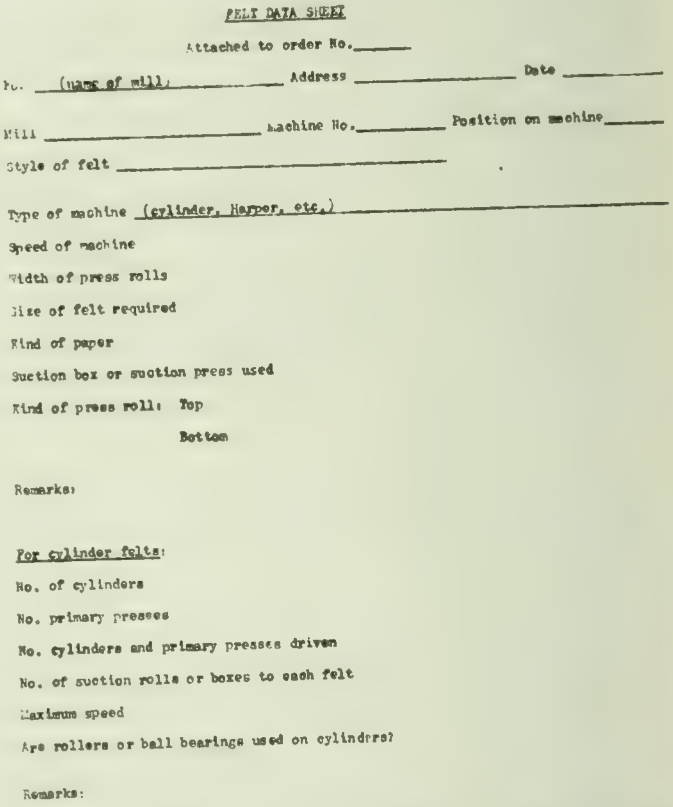
DISCUSSION

I have a suggestion that I would like to throw out for your consideration. I do not know whether it is possible to put it into effect. There can be a good deal of research work done perhaps between the technical men of this Association and the various manufacturers. This suggestion is simply that once you have obtained a series of four or five or half a dozen felts that are satisfactory, and which meet your conditions as well as you desire, get the information from the manufacturer of these felts, the size of the yarn, the grade and weight of the yarn, the quality or specification of the wool from which the felts are made, the number of picks per inch, the weight per square foot on the loom, the finish, the degree of napping. If you do that you can fairly well control your felts. It is done in purchasing military supplies. Army specifications during the war were provided and the manufacturers were compelled to go by those specifications. The quality of the stock, the size of the yarn, the number of picks per inch, and all those factors should be controlled in the manufacture of the best felts just as in the manufacture of the best serge. Felt manufacture is very simple except in the finishing operation. As far as our firm is concerned, either of my brothers who are the managers of the mills and who are felt makers, would be glad at any time to assist in a conference with any committee you may appoint in order to see whether felts could not be standardized and brought up to a greater degree of efficiency than at the present time.

MR. CARRUTHERS: I understand that Mr. Bates expresses the views that are held by the majority of the felt manufacturers. You have heard what he has said in regard to this subject and probably there are some here who wish to ask some questions in regard to it.

MR. McNAUGHTON: I would like to ask a question in regard to the speaker's last statement as to the advisability of the paper manufactories specifying to the felt manufacturer the construction of the felt he requires. Is it not a fact that different felt manufacturers blend their wools differently and that in consequence the construction as specified might not give the desired qualities? It would be obviously out of the question for the paper manufacturer to specify the blending if that were so.

MR. BATES: The blending of the wools, of course, has to be left to the manufacturers. Every mill seems to have different blends. You might specify, generally speaking, the class of wool that is to be used, the tensile strength required in the warp and weft, the finish of the felt, the degree of smoothness and of hardness and, if you did that, the wool manufacturer must use certain wools or he could not produce those qualities. The paper manufacturer would not have to bother his mind about the grades of wool that were used. These would be left to the manufacturer. If he had to meet a certain degree of tensile strength in warp and weft and to produce a certain finish, he would be compelled to use the wools that would produce those results. As far as the variation between different mills is concerned, it is very slight. One manufacturer would vary only slightly the different kinds and grades of wool used as compared with any other manufacturer whether in the United States or Canada.



FELT DATA SHEET

Attached to order No.______

To. (name of mill) ______ Address ______ Date ______

Mill ______ Machine No.______ Position on machine______

Style of felt ______

Type of machine (cylinder, Harper, etc.) ______

Speed of machine

Width of press rolls

Size of felt required

Kind of paper

Suction box or suction press used

Kind of press roll: Top

Bottom

Remarks:

For cylinder felts:

No. of cylinders

No. primary presses

No. cylinders and primary presses driven

No. of suction rolls or boxes to each felt

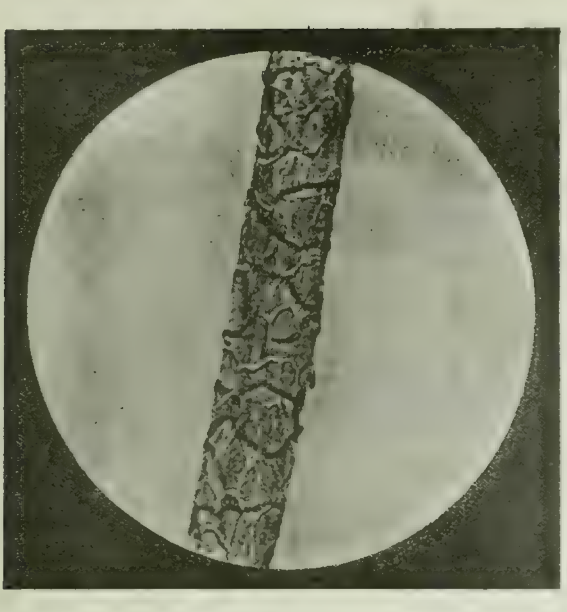
Maximum speed

Are rollers or ball bearings used on cylinders?

Remarks:

Felt data sheet for pulp and paper mills suggested by joint meeting of representatives of Technical Association of the Pulp and Paper Industry and felt makers.

MR. STEPHENSON: It seems to me as if what has been asked for from the paper manufacturer by the woollen manufacturer is analogous to what might be asked for by the user of paper from the manufacturer of paper. If a publisher finds that a certain lot of paper is perfectly satisfactory, and he makes certain physical tests of it, as to finish, strength, absorptivity, ink resistance and moisture content, he can tell the manufacturer of the paper, "That was a satisfactory shipment; you can take that as our specification for that grade of paper." The manufacturer then knows what to use in the making of that paper and the conditions under which it was manufactured. It is not in order for the publisher to tell the manufacturer that he shall use seventy-five per cent groundwood and twenty-five per cent sulphite, or that he shall use a certain percentage of spruce



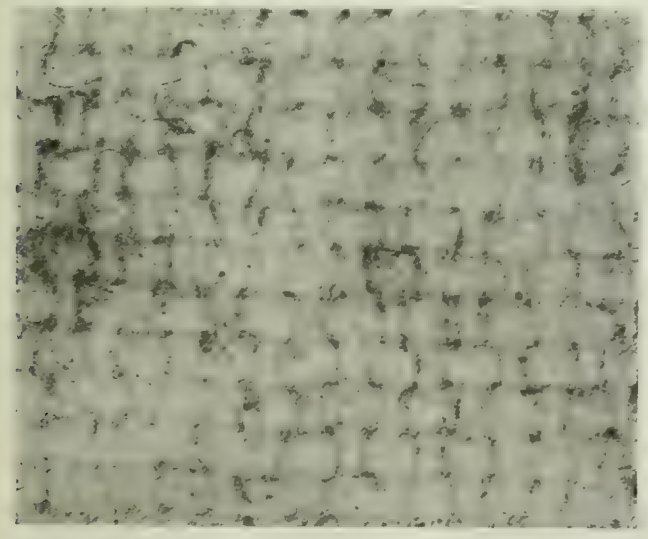
Photograph of wool fibre, showing scales or serrations which produce the felting quality common to wool.

or balsam and eliminate jack pine. No more should the paper maker specify conditions of making a felt if the product is right.

MR. NEILSON: In regard to the question of using various weights of felt on the different presses of the paper machine, I understand—at least I heard some time ago — that the practice in Europe is to use felts of the same weights on 1st and 3rd presses. It would be interesting to know if any of the mills have experimented along this line. We have found from preliminary experiments that using felts of the same weights on the three presses do not seem to give good results. It would be interesting to know what the experience of others has been.

MR. CARRUTHERS: As I understand it, Mr. Neilson, you have experimented with different weights of felt and you have found that the variation in weight does not materially affect the character of the paper?

MR. NEILSON: Not exactly that; we put a 2nd press felt on a third press. Of course, there would be an advantage if you were able to use the same grade of felt on all three presses.

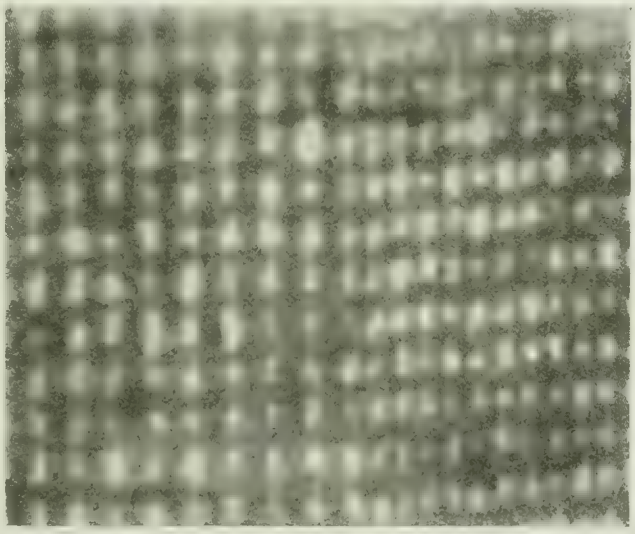


Finished Hydraulic Sulphite Machine Felt showing closely felted surface, and size, ply and twist of yarn. Also plain weave effect.

MR. CARRUTHERS: Is there anyone else present who has done any experimenting along the line referred to by Mr. Neilson?

MR. McNAUGHTON: In view of the use at the present time of the continuous felt washer, is a different character of felt required with that equipment than in cases where the washing is done periodically which is the more general practice?

MR. BATES: I do not know whether that is a question for me to answer. Some of the mill men who have had experience of the continuous felt washer might be able to answer it better than I could. I would like to hear from the manufacturers on that subject. There is no reason why the felt could not be washed satisfactorily and if the continuous felt washer can be used without closing down the machines there should be an advantage in it. I would like to hear from some of you who have tried that out. Before I sit down I would like to say, in connection with Mr. Neilson's statement, that there are mills in Canada using the same felt on the first and second press, but when it comes to using a similar felt on the third press, or the third press felt on the wet press, I think you will run into a great deal of difficulty. On the first press you need more strength and more porosity but you do not require a smooth finish. On the third press you have not the degree of strength you need on the first press, the felt has to have a different finish, be of a different construction, much less porous, and it has to meet different conditions.

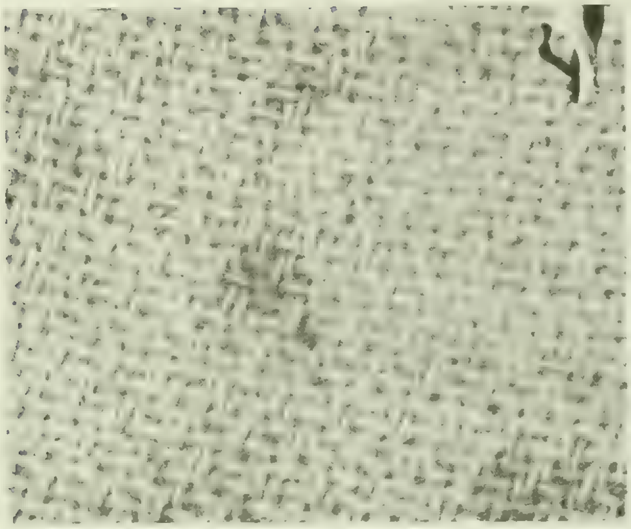


Photograph of finished Groundwood Wet Machine Felt taken by transmitting light through the felt showing Selvidge, and distribution of Napp in spaces between warp and weft.

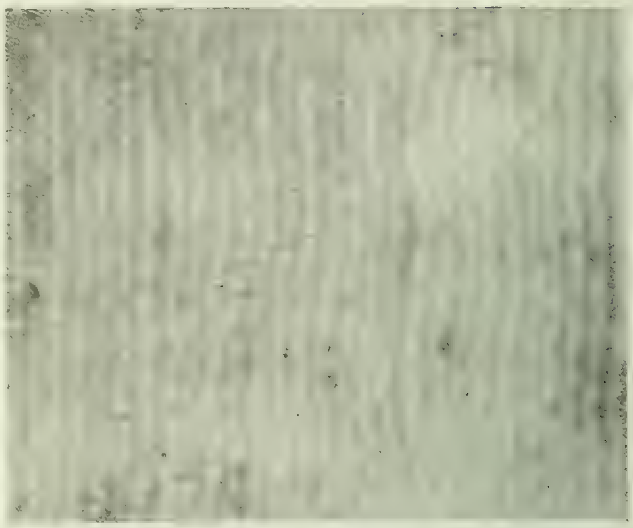
MR. CARRUTHERS: Mr. Mason, I presume you would have had some experience in using the different weights of felt.

MR. MASON: We have had some slight experience with the felt washer, but I am not familiar enough with the details to tell you about it. Mr. Van de Carr could tell you about that. I do not think we have arrived at any conclusions that would be of any value to you or to ourselves. We are passing through the experimental stage that we hope will ultimately yield some result along that line.

MR. C. R. VAN DE CARR: I have not very much to add to Mr. Mason's remarks. We often run through the week without any shut-down. But, when we do have occasion to shut down during the week we take that opportunity to give the felts a real wash-up whether it is essential or not. I know that it is possible to run a felt which is not clean fairly satisfactorily but you are doing



Third press News Machine Felt as taken from the loom, before finishing, showing broken twill weave usee to produce a smooth even napp in finishing.



Photograph of 1st press News Machine Felt finished taken by transmitted light showing open plain weave construction and distribution of Napp in spaces between warp and weft.

it at the expense of drying and we have tests now being carried on to determine whether it is practical from the economic standpoint to keep running from Sunday to Sunday without stopping the felts and giving them a thorough washing. I think our experience so far has been that it is practical but I would not want to make that as a definite statement.

MR. CARRUTHERS: Doubtless there are some other felt manufacturers here who might wish to contribute something to this discussion. If there are we would be pleased to hear from them.

MR. C. BATES: Mr. Chairman and Gentlemen, I did not really come here to-day to enter into the discussion beyond taking up some of the points brought up by the superintendents of paper mills and trying to gather some information for myself. The point brought out by Mr. Neilson is worthy of a good deal of consideration and it is something that should be worked out in the paper mill. The old method was to shut down the machine and clean the felt every twenty-four hours. While the felt was open and clean for the first few hours, it gradually began to get closed up and, during the last few hours of the period, it was quite close and dirty. If you adopt the system of washing the felt continuously, we may be able to give you a closer felt. You may be able to use a closer and heavier felt. That is something that will have to be experimented with very carefully. With the continuous felt washer you may be able to get more speed with the same felt and the same porosity than you do in the old way.

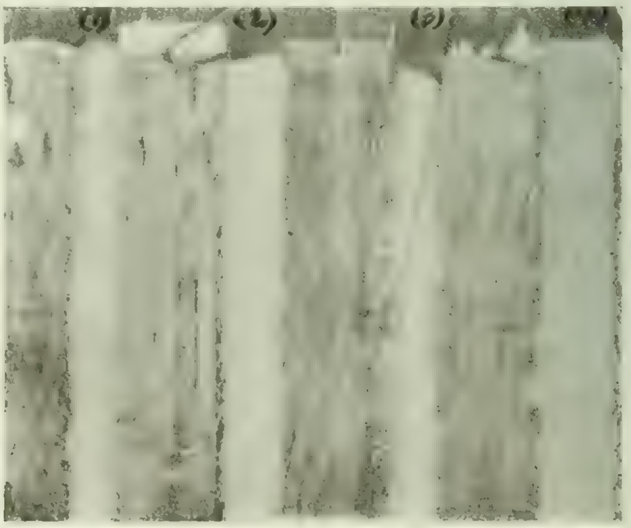
MR. CARRUTHERS: It has been suggested that I ask Mr. Van de Carr if he finds any difficulty in the functioning of the felts as between fast and low speed.

MR. VAN DE CARR: In the functioning or in production?

MR. CARRUTHERS: In the charac'er of the felts.

MR. VAN DE CARR: We find that it requires a different felt. We find that the difficulty of getting the water out of a sheet of paper increases almost directly as the square of the speed of the machine. The felts, particularly for the first and fourth presses have to be much opener than we conceived necessary on our old machines. We are using a felt on the first press which is an entirely different proposition from the average first press felt. It has been a difficult problem to extract the water at a speed of a thousand feet per minute. The continuous felt washer actually takes a lot of

Photograph of finished 3rd Press News Machine Felt taken by transmitted light, showing smooth open weave construction.



Cross section of fniished felts, showing comparative thickness and distribution of Napp. (1) 1st press News, (2) 3rd press News, (3) Book Machine Wet Felt, 4) Plate Felt.

moisture out of the felt. We are not satisfied with our drying yet and I think the felt manufacturers can help us a lot in this matter.

MR. McINNIS: Mr. Bates made two suggestions and he may feel, from the absence of comment on them, that we are a little loath to accept them. One suggestion was that there should be a meeting with the manufacturers with the intention of trying to standardize the felts. But, as has been intimated by Mr. Van de Carr, many problems present themselves in connection with the use of felt in the mill such as the drying at the dryers and the question of whether you want to eliminate a press or get some other finish. I hardly think the paper manufacturer is ready for standardization in felts. It may be stated that none of us are entirely satisfied with our felt service and that the only way we can get the felt service question solved is through the individual competition of the manufacturers.

MR. MASON: There is only one remark I want to make and it is this: Previously, I think the general attitude has been: How long can we make our felts last? Now the question is: How much water can we make the felts take out of the sheet? We do not care if we spend $25,000 or $50,000 if we can get the return, and this is the problem we are up against.

This closed the discussion.

STEAM GENERATION AND UTILIZATION

Mr. CARRUTHERS: We are to have a symposium on "Steam Generation and Utilization." I have much pleasure in introducing Mr. R. L. Weldon, Mechanical Engineer, Three Rivers Pulp and Paper Company, who will present a paper entitled "Money from Steam; Helping the Sales Department."

Mr. Weldon presented the following paper:

"Money from Steam; Helping the Sales Department" by Mr. R. L. Weldon." (See Pulp and Paper Magazine January 19, page 45.)

During the reading of the paper, Mr. Weldon gave an illustration of the use of Diagram V, using for this purpose an enlargement of the diagram. This was the enlarged form of the diagram which he referred to in the body of the paper as "for use in the mill." Colors were used for the various lines on the diagram, and the scales were blocked out similar in manner to an engineer's levelling rod, in order to render the diagram in as simple a manner as possible for the use of the non-technical man. Glass headed pins were used, inserted at their respective points and joined with a black cord, the intersection of the cord on the final line giving the required answer.

Mr. CARRUTHERS: Gentleman, you have heard the paper; have you any suggestions to make or questions to ask?

Mr. WARDLE: I think Mr. Weldon's paper has been very interesting. I do not think he will mind telling us, and some of us may be interested in knowing, how the various lines on Chart V are obtained.

Mr. WELDON: This is a little difficult to explain without the use of a blackboard on which to demonstrate; however, the first thing necessary to develop a diagram of this nature is to develop the formula which gives the required answer, and it needs to be worked out to contain as few variables as possible to reduce the number of lines necessary in the diagram. For every variable, we have to have one line and several extra lines as well. The formula used for this diagram reads.

$$\text{Cost per ton of paper} = 0.375\frac{MC}{ST}$$

where:—

M = meter reading of steam used by the machine in pounds per hour.

C = cost of steam, in cents per 1000 lbs.

S = speed of machine, in feet per minute.

T = trim of machine, in inches.

The diagram merely performs the operation of multiplication and division as required by the formula, multiplying first M and C together, obtaining the answer on line (3) which is not graduated, since we are not concerned with that particular answer, then dividing by 5 the answer coming on the ungraduated line (5), finally by T obtaining the required answer on line (7). The graduated lines are all logarithmic scales, the scales being fixed by the geometrical relations of the lines to one another. The constant of 0.375 disappears in the process of relating the lines to one another and of choosing the proper scales.

Mr. McNAUGHTON: In that portion of the paper describing the installation of the hot well it is stated that:

"The hot well is of the closed pressure type, exhaust steam being used to maintain pressure and temperature."

That is illustrated in Diagram I. In the diagram there are indicated traps between the dryers and the hot well. Would not such a condition as a closed hot well militate against the operation of the traps unless they were of special type?

Mr. WELDON: It is exactly the same as returning the feed water to the boilers directly, and any of the ordinary traps such as are in general use for this purpose would be satisfactory, as for instance Crane, Farnsworth, Detroit, etc.

Mr. McNAUGHTON: The hot well is largely to reserve the hot water instead of shooting it back to the boilers?

Mr. WELDON: Yes, largely. It also serves the important purpose of absorbing a certain amount of heat from the exhaust steam; consequently we can pass more steam through the turbines, or engines, and thus get more power from our prime movers without materially affecting the heat balance. In other words, it is a means of obtaining additional power at a very cheap rate. The closed hot well is perhaps an innovation in the paper mill. It is very common on board ship and particularly in ocean going ships where the feed water for the boilers is recirculated entirely, since the water used in the boilers taken from the sea must be evaporated and condensed to remove its salt. That is largely the reason for the closed hot well in its original form.

Mr. McNAUGHTON: How is your installation laid out to take care of the air which is ordinarily accumulated in the dryer?

Mr. WELDON: Of course, when you start up on Monday morning it might be necessary to do that by hand. As to the question of "how?" I have not carried that particular point with regard to the removal of air very far in detail; but it would be done similarly to the way Farnsworth operates the closed system. by returning the water from the traps directly to the boilers. That is not a particularly complicated system to operate.

Mr. WARDLE: When you put the price of power at $25, does that mean what the operator would have to pay if he bought it outright?

Mr. WELDON: That is correct, and was the figure used in preparing Diagram III.

(To be concluded).

THE ELMENDORF TESTER FOR TESTING TEARING STRENGTH.

The purpose of this paper is to show how the basic quality of paper can be determined in accurate dependable figures. Such figures are readily comparable and render the writing of paper specifications less open to criticism, and make it possible for the mill and the jobber to furnish the exact grade of paper required.

Paper Quality Dependent on Fibers

Paper quality in the first place is dependent upon the quality of the fibers used in its making. Paper made from good fibers will be superior to paper made from poor fibers manufacturing conditions bing equal. Starting with good fibers, the primary requirement of the paper maker is so to treat and lay the fibers that they will bond in the strongest possible manner so that the sheet of paper (entire fiber structure) will be strong and not tear apart. By virtue of the fact that it has good fibers to start with the paper will probably show good strength if torn across the grain. If, however, there has been a failure to make a proper bond of all the fibers, the paper will tear easily with the grain.

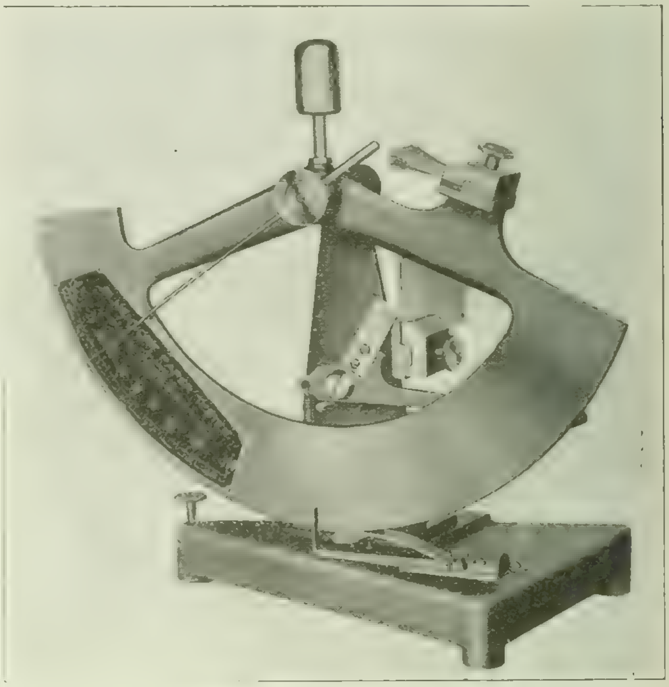
Step by step it has become more and more difficult for the buyer to know what kind and grade of paper to select for his requirements and today he has a better chance of knowing whether the suit of clothes he buys is long fiber virgin wool, part shoddy, all shoddy, part cotton, or a mixture of all than he has of what kind of fibers may be in the paper he buys or how well it will wear. Particularly is this true considering the fact that frequently "fillers" are used in paper-making which add to its weight and other substances make it appear stronger, and make a hard crackly sheet that looks as if it would stand great wear and tear, but this one outstanding fact remains, — the tearing strength is only as good as the fibers and no amount of glue, sizing nor calendering will strengthen those fibers although the sheet may show a high "pop test."

An instrument which has recently been developed for measuring the quality of paper by the tear in both directions is the Elmendorf Paper Tester.

It is quite evident that more strength and wearing quality (tearing strength), is required of a Kraft wrapping than of a writing paper, and greater tearing strength for a tag paper than for a bond paper. Therefore, in order that the buyer and the user of paper may know just what standard papers do test and what they should test to fulfil the requirements may be made showing the Tearing Strength values of several weights and grades of various kinds of papers.

By comparing the results of tests on his samples with the standard for that grade, the buyer can tell immediately whether the paper he is buying is a high grade or a low grade paper. Also, he can judge what strength paper he wants to meet his requirements, and knows how to specify clearly what he wants.

Relative Strength With and Across Grain.



The Elmendorf Tester

Equal strength in all directions is the quality sought in most papers for its resistance to wearing and tearing effects, thus it follows that in the best papers the with-grain tear strength approaches closely the across grain strength. It is true of paper as it is of the chain,—"only as strong as its weakest link". If the tearing strength of paper is much more across the grain than it is with the grain, the additional strength across the grain is not only wasted but the paper will easily split with the grain, this being not only an undesirable feature but a positive detriment in many papers. The paper which will tear equally well both ways is the ideal for which all strive.

The Elmendorf Paper Tester gives figures which are representative of the paper under test. Four to sixteen narrow strips are torn in making these tests, so it will be seen that the figures represent the average tearing strength of a large sheet of paper. The average is still further increased in value by the fact that the instrument tears the one sample four or more times, it figured out this represents a tear of from two to nine feet of paper. It is not fair to the paper maker to confine a test to two or three square inches and say that such represents his paper.

The Thwing Instrument Company, of Philadelphia, who have developed a number of scientific instruments are manufacturers of the Elmenderf Tester. They are represented in Canada by Industrial Appliance Co., Royal Bank Bilding, Toronto.

ST. MAURICE PAPER MEET

The annual general meeting of shareholders of the St. Maurice Paper Company, Limited, Canadian subsidiary of the Union Bag & Paper Company, was held at the Montreal office last week. The meeting was a routine one, and the annual financial report, which has been reviewed in the papers, was adopted as read. M. B. Wallace, the president, was in the chair. The retiring board of directors was re-elected without change from the preceding year, as follows:— M. B. Wallace, president; Alex. MacLaurin, E. B. Murray, C. R. McMillan, vice-presidents; T. M. Day, Thomas McDougall, R. M. Smith.

Shawinigan Falls, Quebec.—The Belgian Industrial Company here is preparing to extend its paper mill, the cost of which will be from one and one-half million dollars to two million dollars. This does not include the cost of machinery. Preparations are now being made for excavation work and it is expected that the plant will be completed sometime during the middle of next year.

BRITISH PPAERMAKERS' ASSOCIATION

(Special From Our London Correspondent)

The 1922 annual meeting of the British Papermakers' Association of Great Britain and Ireland, was held, in London, under a shadow of trade despondency. As the President, (Mr. W. Leonard Tod), observed, he hoped there would be soon an appearance of the silver lining to the dark cloud, as it was long overdue. Last year and this year are two periods the members will not forget in a hurry—and they have still some good rock ahead. The principal business dealt with at the meeting included the election of officers, discussions on Association finances, transport charges—high rates are crippling mills—and a short reference to the technical section. As a rule the meeting is "short and sweet", all the important business and debatable subjects being fully trashed out before the great annual gathering in London.

Annual Report

Since Mr. A. W. Foster, B. A., has become Secretary to the Association, a most enlightening annual report is prepared. This year's is no exception to the rule, and in it he gives a nice summary of what is being done by the Association and what is to be done. He "kicks-off" with a little history as follows: –

"Although the Papermakers' Association under its present incorporated constitution only dates from 1912, the two Associations whose amalgamation brought about its existence had a long and eventful previous history, and the year 1921 was the 57th year from the formation of the Scottish Association and the 50th from the foundation of the English one. It must be admitted that, as a jubilee year, 1921 could not well have been more depressing or disastrous. The stagnation which overtook the industries of the country in the autumn of 1920 and continued during the early part of 1921 was itself sufficiently deadly, but its effects were multiplied a thousandfold by the immeasurable disaster of the coal stoppage, which for three months, completely prevented the raising of coal, put an end to its export from the United Kingdom and paralysed nearly all our industries. At the end of June, in addition to the million workers in coal mining there were 2,178,000 insured workpeople on the books of the Labor Exchanges (Government places to find work for the workers) as totally unemployed and nearly another million on half-time or less."

Paper Mill Workers Out

"In papermaking", proceeded Mr. Foster, "17,027 were totally unemployed and 12,332 on half-time or less, a total of 29,359 representing more than one-half of those engaged in the industry. The immediate effect of this state of affairs was a serious falling-off in purchasing power, every branch of commerce was adversely affected and the demand for paper, which is directly dependent upon the prosperity of trade in general, was reduced to the lowest proportions, as will be seen from the fact that the end of the year six months after the dose of the coal stoppage, the unemployment figures were as high as 8,289 completely out of work and 5,163 partially unemployed (in paper mills). At the same time with this cessation of orders, the papermaking industry had to face a sensational fall in the market price of its raw material, and had to solve the many problems arising from the determination of Excess Profits Duty (British taxation). Mechanical wood pulp fell to ¼ of the price which it fetched in the summer of 1920 and chemical woodpulps followed on similar lines the result could be disposed of, and even the small quantity which could be made into paper was only saleable at greatly being that papermakers, most of whom were due to take delivery at prices fixed at the summit of the market, were faced with the difficulty of financing their contracts at a time when little of the material could be disposed of, and even the small quantity de-depreciated prices. The problem of collective agreement as to modification of pulp contracts was discussed between the Association and the British Wood Pulp Association, but it was fully recognized that individual circumtances differed so greatly that no general rule could be laid down, and the Association confined its action to putting members in touch with one another where common interests were involved."

Wood Pulp Contract Note

The report went on to deal with cases of hardship arising out of the Excess Profits Duty and the part the Association played in getting the Safeguarding of Industries Act ("Key" industries Act) introduced—and under which the Association is presenting an application to safeguard paper from places like Germany and Finland— and it also contained a reference to the old perenial subject "Wood Pulp Contract Note." No report would be complete without it. This year says: "The Association has been engaged during the year on a revision of the Wood Pulp Contract Note, in conjunction with the British Wood Pulp Association and the Scandinavian Associations. The wording of the note, it is recognised, leaves much to be desired as to precision and definition and it is hoped that in its final form, the revised note will prove to be a more workmanlike and satisfactory instrument." This note, it should be explained, has created more discussion than Wilson's 14 points at the Peace Conference.

The report goes on to deal with codified Trade Conditions. The last revision was in 1906 and the new code was introduced in January 1922, as published in "Pulp and Paper Magazine", and the report hopes that papermakers will maintain its provisions.

Future Development

Under this headline reference is made to the great value of the Association, as a consultant, and it is intended to develop the statistical work such as giving a record of output, sales, and orders, to all members, instead of to a few individual forms, from the industry itself and not from Government sources. In other words the system of the American Papermakers Association is suggested, to a certain degree. Mr. Foster says: "It is most desirable that authentic information should be forth coming from the trade itself".

Mr. Leonard Tod, reviewed the annual report at length and moved adoption, which was agreed to.

The finances showed the Association to be in a healthy condition so far as money is concerned. It was, however, considered very important to build up a good reserve fund.

Election of Officials

In the election of officials, Mr. Leonard Tod was again selected President. This will be his third year of office. He belongs to one of the large Scottish mills (Wm. Tod, jr. and Co. Ltd. Polton). The other officials are: Mr. Herbert Green, re-elected Treasurer; Trustees: Lord Dovedale, Mr. Lewis Evans, and Mr. Ralph Reed (son of the late Mr. A. E. Reed); Secty: Mr. A. W. Foster B. A., assistant secretary. Miss Ingram. A hearty vote of thanks was passed to Mr. Tod for his services to the Association and to Mr. Foster for the able way be carries out his duties.

TARIFFS PROPOSED ON PAPER AND PULP

Washington, D. C., April 11, 1922. — Following are the complete lists of proposed new tariff duties on paper and pulp carried by the McCumber Tariff bill as reported to the Senate today by the Finance Committee, and with them are compared the duties proposed by the Fordney bill, passed by the House on July 21, 1921, and the rates imposed by the Underwood law of October 3, 1913, in columns 1, 2 and 3. All of the Underwood rates are still in force except the comparatively few on agricultural products, which were changed by the emergency tariff bill passed last year. We quote the Paper Mill.

In these lists the unit of taxation in the Senate schedules as weight (ounce, pound, hundredweight, ton, etc.) or volume (bushel, etc.) or square or cubic measure or ad valorem value (indicated by the character p.c.) is stated after the name of the article. Changes from this until of taxation are specifically stated under the columns for House rates or Underwood rates.

SCHEDULE 13

Pulp, Papers and Books	1	2	3
Chemical wood pulp, unbleached or bleached (p.c.) . .	5	Free	Free
Printing paper not specially provided for elsewhere (lb.)	¼c.+10 p.c.	¼c.+10 p.c.	12 p.c.
Paper board, wall board and pulp board, including cardboard (p.c.)	10	10	25
Leather board (p.c.)	10	10	Free
Sheating paper (p.c.).	10	10	5
Sheating felt (p.c.),	10	10	Free
Filter masse or stock, wholly or partly of wood pulp (lb.)	1½c.+25 p.c.	1½c.+15 p.c.	20 p.c.
Indurated fiber ware, pulp and papier mache manufactures (p.c.)	30	23	25
Tissue, stereotype, copying and carbon paper (lb.) . .	5c.+15 p.c. to 6c. lb.	5c.+15 p.c. to 6c. lb.	30 p.c.
Surface coated papers (lb.)	5c.	5c.	25 p.c.
Papers, coated surface, embossed or covered with metal (lb.)	5c.+20 p.c.	5c.+15 p.c.	25 p.c.
Papers, covered with metal leaf or fancy effect not lithographic (lb.)	4½c.+20 p.c.	4½c.+17 p.c.	35 p.c.
Decalcomania paper	Free	5c. lb.	Free
Cloth lined paper (lb.)	5c.+20 p.c.	5c.+17 p.c.	35 p.c.
Wax coated papers (lb.)	3c.+25 p.c.	3c.+17 p.c.	35 p.c.
Bags, printed matter other than lithographic, box, etc., (lb.)	5c.+35 p.c.	5c.+20 p.c.	35 p.c.
Plain basic photographic paper (lb.)	3c.+20 p.c.	3c.+15 p.c.	15 p.c.
Sensitized paper (lb.)	3c.+25 p.c.	3c.+20 p.c.	25 p.c.
Wet transfer paper (p.c.)	65	30	25
Writing, letter, note, drawing, Japan, ledger, bond, record, tablet, typewriter and onion skin paper (lb.)	3c.+15 p.c.	3c.+15 p.c.	25 p.c.
Same, ruled, printed, etc., shall pay in addition (p.c.)	10	10	25 p.c.
Bristol board (lb.)	3c.+15 p.c.	3c.+15 p.c.	25 p.c.
Paper envelopes shall pay same rate of duty as paper from which made, and in addition thereto:			
If plain (p.c.)	5	5	15
If printed, etc. (p.c.)	10	10	35
Jacquard designs on ruled paper (p.c.)	35	23	25
Hanging paper, not printed	10	10	25 p.c.
Hanging paper, printed (lb.)	3c.+20 p.c.	20 p.c.	25 p.c.
Wrapping paper (p.c.)	30	23	25
Blotting paper (p.c.)	30	2c.+10 p.c.	25
Filtering paper	30 p.c.	5c.+15 p.c.	30 p.c.

STRIKE VOTE ORDERED

Paper Makers Object to Wage Reduction

Albany, N. Y., April 18. — Orders for a strike vote on the proposed ten per cent wage reduction of paper mill owners have been sent to every union in the United States and Canada, Jeremiah T. Carey, of Albany, president of the International Paper Makers' Union, made known today.

Mr. Carey said that a conference between representatives of the union and owners would be held in New York April 26, and that the result of the vote will be known at that time. He indicated that no announcement of the vote would be made until then or possibly the day before.

A new telephone directory for the use of 570,000 subscribers in the city is being distributed by the New York Telephone Company. The new volume weighs five pounds and contains 1,320 pages. Altogether 1,041,000 copies of the book will be distributed. To print the issue required 3,000 tons of newsprint paper and 46 tons of cover paper, making the issue the greatest the company has yet printed.—New York Times.

PULP AND PAPER NEWS

The lumber trade in Eastern Canada has not revived to anything like the extent expected. While a moderate amount of lumber has been sold, prices are not, as a whole satisfactory, in fact, stock is being disposed of at quotations which represent losses in some instances. Spruce is dull, and the lower ends of hardwoods are almost unsalable. The British Government has some very large stocks in the Maritime Provinces, and efforts are being made to sell these at various prices, according to conditions. A representative of a Montreal firm who has just returned from the Maritime Provinces states that the lumber trade there is in poor shape; stocks are large, and are very difficult to move.

It is reported in the Hants (N.S.) Journal that American paper manufacturers are interested in the Premier Power and Pulp Co., at Hartville, N.S., and that a large sum of money will be expended in further developments.

Mr. Geo. Challes has returned to Toronto, having been south of the line for three or four weeks. He reports that while conditions are hardly crystallized sufficiently to make definite statements, there is a steady undertone of gradually increasing confidence.

PAPER BOX MAN DIES SUDDENLY

Mr. Finlay B. Smith, Manager of the A. D. Shoup Paper Box Company of Toronto, was found dead in bed, Saturday, April 8th, at his home at Mimico Beach.

The late Mr. Smith, who was 58 years of age, came to this country from Glasgow at an early age and settled in Galt. Later he went to Philadelphia where he subsequetly entered the employ of Stokes and Smith, makers of wrapping machines, remaining with them a number of years. He came to Toronto about nine years ago as Manager of the Shoup Paper Box Company. Mrs. Smith and two daughters survive him.

READY FOR NEW BRUNSWICK DRIVE

With word that ice has been running over the Grand Falls, the St. John River Log Driving Company have started preparations to catch the 1,500,000 feet of old logs which are reported to be the only lumber coming down the river to the booms here this season. For this purpose, Walter Jackson, the company's manager, has been at St. John getting the tugboats and motorboats launched so that the drift may be commenced from there, and any logs which come down the river in the wake of the ice run can thus be caught.

Later the booms will be put in position below Fredericton, but aside from sheer booms none will be hung above here.

CANADIAN PAPERBOARD 7'S

Prospectuses of the offering of $800,000 7 per cent first mortgage sinking fund bonds of the Canadian Paperboard Company, Limited, are out. The offering is being made at 95.50 and accrued interest yielding over 7 1-2 per cent. Other details given have already been reviewed in these columns. Canadian Debentures Corp. is making the offering.

STILL INTERESTED IN MR. BACKUS

In the Ontario Legislature, Wednesday, April 12th, Mr. Kennedy asked the following questions:—

1. (a) Has E. W. Backus furnished bonds to guarantee that he will carry out his undertakings in connection with the English River Limits? (b) If not, why not? (c) If so, what is the amount and the condition of the bond, who are the bonds-men? 2 (a) Under Clause 5 of the Agreement of September 30th, 1920, between the Province of Ontario and Mr. E. W. Backus, it is stated among other things, as follows:—

> "The Company........ specifically undertake that they will construct and place in operation one unit of the said pulp-mill of fifty tons daily capacity not later than the 1st day of October, 1921."

Has Mr. Backus fulfilled this special portion of the Agreement. (b) If this condition of the contract has not been carried out, does the Minister on account of such default intend to cancel Agreement of September 30th, 1920? 3. (a) Does the Agretment of September 30th, 1920, confer on Mr. Backus a permanent option on the White Dog power without any specific limitation as to time of development? 4. Is the Government aware that the Company is paying only 25c. per hour for labour at Kenora?

And the Minister of Lands and Forests replied in the words followings:—

1. (a) Yes, (b) See answer to (a), (c) $250,000. Dominion of Canada Bonds. 2. (a) As far as it was possible having regard to Dominion Government delaying approval of plans. (b) See answer to (a). 3. (a) No. 4. No.

I. P. COMPANY'S REPORT

The International Paper Company's annual report, which was sent out to stockholders last Wednesday, showed a loss, after charges, dividends on preferred and inventory adjustments, of $1,166,282 compared with net income of $11,836,362 in 1920. President Philip T. Dodge takes a hopeful view of the future, despite the discouraging results of the past year's operations. "The decrease in the inflow of European paper," he points out in the report, "the growth of the country and the increased consumption of news which will inevitably follow should, in the not distant future, create a demand equal to the capacity of all the existing mills. When this condition arises, prices will be stabilized and made reasonable, and when the high-priced raw materials now carried by nearly all the manufacturers are consumed, and labor and material carried to a lower level, the manufacturers in general should be able to produce at a cost and sell at a price which will cause general prosperity." The balance sheet of the company at least was pleasing, showing a working capital of $17,000,000.

Mr. I. W. Killam and his bride, formerly Miss Dorothy Brooks Johnston, of St. Louis, Mo., are sailing by the Homeric today from New York to spend their honeymoon abroad. (A typographical error was made last week in spelling Mr. Killam's name.)

Technical Section

REVIEW OF RECENT LITERATURE

A-3. The Utilization of Bamboo for the Manufacture of Paper Pulp. R. S. PEARSON. **Indian Forester,** xlvi, 547-561, 603-631, (1920); **Botanical Abs.,** viii, 24, (May 1921). Data are given on the probable yields, costs of extraction, location of mills, etc., for the various localities in India where pulp material exists in sufficient quantity to warrant the establishment of pulp mills. -A. P.-C.

A-3. Paper Making Trials at the Imperial Institute: a Comprehensive Review of Plant Fibers for Paper Making. C. J. WEST. **Paper,** xxviii, 28-31, (May 18, 1921), 25-27,39, (May 25, 1921). A review of the more recent work of the Imperial Institute (from about 1921) on the following paper making fibers: **Andropogon hirtifloris,** aniga stems **(Montrichardia arborercens)** bamboo grass (from Northern Territory, Australian), **digitata),** black wattle **(Acacia decurens,** var. **mollissima),** bourdie grass **(Typha sp.), Brachystegia Randii** bark ("musasa"), **Cymbopogon Ruprechti, Cyperus alepecuroides, Ecdeiocolea monostachya** leaves, **Hibiscus tiliaceus,** Linn. ("vau"), Johnson grass **(Sorghum halepense),** kokerboom **(Aloe dichotoma),** lalang grass **(Imperata arundinacea Cyr.),** linseed stalks, matai or black pine **(Podocarpus spicatus),** muguguboya bark, mungongo wood **(Ricinodeddron Rautanenii, Neoboutonia macrocalyx,** Panicum obscurens, papyrus **(Cyperus papyrus),** rice straw, rice husks, sunflower stems, tabocca brava (a Brazilian bamboo), tambookie grass **(Cymbopogon Nardu,** var. **vallidu), Andropogon dregeanus** (Nees), **Andropogon auctus** (Stapf, thatching grass **(Andropogon Buchananii), Themeda forskalii** ver. **mollissima, Trachypogon polymorphous, Tristachya rehmanii.** -A. P. -C.

B-2. Increment Per Cent of the Form-Height in Pine Stands in Sweden. SEVEN PETRINI. Meddel. Statens **Skogsforsoksanst,** xvi, 184-187, (1919); **Botanical Abs.,** viii, 25, May 1921). Volume increment per cents are calculated from the basal area increment per cent and the "form-height" increment percent. The latter term expresses the product of height and form factor. If tables of "form-height" increment per cent are available the increment per cent may be ascertained by merely measuring diameters. Jonson has prepared such tables for pine in central Sweden. Petrini, following Jonson's procedure, has prepared similar tables for northern Sweden, where the pine has a different form. The method, which is briefly described, involves the measurement of heights and the determination of "mean form class" by means of the "form-point" and Jonson's function between "form-point" and "form-class". -A. P. -C.

B-3. Snow Breakage and Top Rot in Spruce. TORSTEN LAGERBERG **Meddel. Statens Skogsforsoksanst,** xvi, 115-162, (1919); **Botanical Abs.,** viii, 22, (May 1921). Working plans are often seriously disrupted by snow damage. The calculated annual yield may be greatly increased by salvaging fallen or badly injured trees. Even uninjured trees must sometimes be cut in order to save them from windfall or drought. Until recently it has been a difficult problem to decide what character and degree of damage is permissible in trees which are left. The present investigation shows that broken stems are almost invariably attacked by rot and should therefore be removed from the stand. The rot progresses more rapidly in rapidly growing than in slowly growing trees. Callus and exudations from the wound may delay and in rare cases prevent infection.- A.P. -C.

B-6. The "Form-Point" as an Expression of Trunk Form. SEVEN PETRINI. **Meddel. Staten Skogsforscksanst,** xvi, 164-183, (1919); **Botanical Abs.,** viii, 25, (May 1921). The investigation aims to test the accuracy of Jonson's "form-point" method of estimating volume and taper when applied to different stands of individual trees, and also the variations in results obtained by different persons. Estimates were made on 54 samples plots each having an area of 0.6 acre. On 10 of the plots the "form-point" was determined by six different persons. Estimates for single stands show an an average deviation of +4 per cent of the height of the tree. The average personal error for a stand was 1.17 per cent. Estimates of individual trees by different persons varied as much as 10 per cent. The author concludes that the "form-point" of single trees cannot be determined with any great degree of accuracy, but the average "form-point" of a stand can be satisfactorily determined. -A.P.-C.

B-9 Reshaping the Forest Policy of the United States. J. W. TOUMEY. **Sci. Monthly,** xii, 18-35, (1921); **Botanical Abs.,** viii, 27, (May 1921). The failure of the U. S. to retain control of the forests and the consequent exploitation by private owners without reference to the continuance of the forest has resulted in an acute situation. The lumberman and the paper manufacturer, as well as the forester, are beginning to realize the necessity of a change, especially in view of the increasing price of forest products. Three leading policies are now before the country: (a) The program of the committee of the Society of American Foresters; (b) the program of the American Paper and Pulp Association and various lumber interests; (c) the program of Col. H. S. Graves, former chief of the U. S. Forest Service. These do not differ in desired results, but in methods of attaining them. The first proposes that laws be enacted by Congress imposing severe penalties on private owners who do not organize their property and practice forest renewal. The second insists that through co-operation and financial assistance the nation and the states make sustained yields on privately owned forests attainable without loss to the owner. The last urges that the state enforce mandatory regulations and provide adequate assistance in co-operation with the National Government to make forest renewal certain. This plan would necessitate effective measures for organization, police regulations for fire control, effective disposal of slash in all cutting operations, establishing cutting methods suited to each forest type. -A. P.-C.

R-1. The Manufacture of Paper in France. ANDRE NAVARRE. **Monit. Papeterie Francaise,** lii, 388-391, (July 1, 1921); **Papier,** xxiv, 297-299, (July 1921). A discussion of the possibility of manufacturing ordinary print and book papers in France, showing that France is in as good a position as Germany and England, if not better; but that it is necessary to give the industry adequate tariff protection to prevent it from being flooded by cheap papers from Canada, the United States, Scandinavia and Finland. -A. P. C.

UNITED STATES NOTES

The prospects of a strike in the paper industry at the expiration of the present contracts loomed large following a conference last Friday in New York City between the paper manufacturers and the representatives of the unions concerned in the industry. After the employers had presented the demands on which they seek to base the new contracts, J. T. Carey, President of the Paper Makers' Union, stated that they had come as a complete surprise and that the unions could not possibly accept them. The three main demands put forward by the manufacturers were a 10 per cent. cut in wages for skilled labor, the elimination of a standard rate for unskilled labor and the abolition of the system of increased pay for overtime work. Mr. Carey said that a strike on May 1 would involve workers in the United States and Canada. With 100,000 workers affected at the beginning of the strike, he said, the number would grow as it spread. At the conference there were representatives from seventeen large paper manufacturers, with an output of 4500 tons a day. Floyd L. Carlisle of Watertown, N. Y., was the spokesman for the manufacturers. J. P. Burke, President of the Pulp and Sulphite Workers' Union and Mr. Carey represented the workers. (According to Senator Willis, there are only 90,000 men in the whole U. S. paper industry; and there are about 26,000 in Canada.)

If the trade association conference at Washington does nothing else but determine the proper status of uniform cost accounting work, it will, in the opinion of many organization executives, have performed a most useful service. An association representative attending the conference explained that the doubt which surrounds accounting work of this character has prevented progress in a direction which would be of the greatest benefit toward intelligent production and competition. "Allowing for the fact," he said, "that some organizations have put their cost figures to improper use, there should not be the discrimination which exists toward systems which enable producers to accomplish economies they otherwise would not find."

Addressing the trade association conference last week, F. M. Feiker, vice-president of the McGraw-Hill Company, reported on the results of approximately 100 questionnaires sent out to editors of trade journals, chiefly with regard to the special efforts which have been made to stabilize production and employment in certain industries, and as to what use is made in industry of statistical information, such as that desired from the trade associations by Mr. Hoover, in studying business conditions. Not only was the need of more basic statistics in industry emphasized by the replies to the questionnaire, said Mr. Feiker, but more information as to how to use statistics. While the answers to the questionnaire revealed a dearth of effort to combat depression in many industries, he said, there were also many examples of work in this direction that has been accomplished by individual plants, but never co-ordinated.

At the annual meeting of stock holders of the Union Bag and Paper Corporation, held April 11, plans providing for the issuance of $15,000,000 new bonds were ratified. Between $6,000,000 and $7,000,000 will be issued at present. Their proceeds will be used in part to retire $2,195,000 of the company's 5 per cent bonds outstanding. Retiring directors were re-elected.

A report reaching New York from Monterey, Mexico, tells of exhaustive experiments in manufacturing paper from the leaves of the henequin plant. The tests were conducted by the San Rafael Paper Company of Mexico City, and they are said to have proved so successful that the company will build a large mill at Merida, Yucatan, for the purpose of utilizing the raw product in the manufacture of paper pulp. The company has for many years operated a large paper mill in Mexico City. Paper made from the pulp of the leaves of the henequin plant is of unusually high grade, it is asserted. The output of the proposed mill will be used to supply the home demand in Mexico, and whatever surplus there may be will find a market in Central American countries, it is expected.

Many State Governors have followed President Harding's action in proclaiming the present week Forest Protection Week, and throughout the nation the six day period is being marked by educational and instructive exercises impressing upon the public the disastrous effects of the present waste by forest fires. State officials and civic and commercial organizations are working together in devising the best means to be used in their own communities for carrying out the purpose of the week. The Forest Service of the United States is taking a keen interest in the movement and its 2500 officers, located for the most part in the West, are having extensive exercises. The idea of Forest Protection Week originated in the Pacific Northwest in 1920, and was largely obsered that year throughout the West. Fifteen years ago the bulk of public sentiment against forest fires was in the East; to-day it is in the West, where 61 per cent of the nation's remaining timber supply is now located.

C. P. Wilbur, State Fire Warden of New Jersey in directing attention to the Protection Week observance, emphasizes the dependence of every individual upon the products of the forest. He says: "We should appreciate the wisdom of growing these products near at home as we may, instead of paying, as New Jersey does, $5,000,000 yearly for freight alone on timber from the rapidly exhausting supplies of the South and West."

An unusual method for checking a stubborn forest fire was resorted to last Thursday at Rahway, New Jersey, when difficulty in pumping water from a reservoir made it impracticable to combat the blaze with water. Chemicals and sand bags brought into the fight against the flames served most effectually to prevent their further spread and resulted in putting the fire under control after it had swept through the timber for six hours.

The Empire State School of Printing, which is supported by newspaper publishing interests in New York State, will open at Ithaca, N. Y., May 1, according to an announcement made last Friday by Ross W. Kellogg, director of the institution. Applications from 100 prospective students have been received by the director, but the school will accomodate only one-fourth that number, he said. A six months' course will be given all regular students, while special courses will be provided for entrants having had previous printing printing experience.

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, April 18. There is little change in the pulp and paper markets. The local demand for paper is moderate—the jobbers are continuing the policy of purchasing only for immediate requirements, the orders being often of the rush character. This policy is determined by that of the jobbers' customers, who purchase as a rule in small quantities, according to their needs. The recent recession in prices has not improved trade to any extent, but it has enabled Canadian manufacturers to meet competition in some degree.

Newsprint is the brightest spot so far as demand is concerned. The orders for foreign account have come in at a very satisfactory rate, and the mills are now running to capacity. The indications are that the consumption of newsprint in Canada and the United States is on the upgrade, and that although production is increasing it will not exceed the supply, especially as Canadian mills have secured good business outside the North American Continent. If general commerce picks up, then advertising will increase, and additional advertising means the use of more newsprint. The newsprint industry is dependent to a large extent on conditions in the United States, and in this connection it is of interest to note that the foreign trade in March was the largest since October. Against this, the coal strike is bound to affect business in the future, and the tariff proposals must have a disturbing influence.

Book and fine papers meet with a fair demand, with cheap American bonds still coming on to the market. Wrappings continue to be in steady request, and tissues and toilets inclined to be spotty. There is a little more life in roofing papers; rags show little change; and waste paper is in good demand.

The pulp market is still dull, although there is an increase in the inquiries for ground wood. The sulphite position is unaltered.

Pulpwood is very slow. An operator in Northern Quebec stated that the American mills are buying very sparingly and that prices are low. Very little wood has been taken out this winter, and a flurry in the fall was predicted on account of a shortage. According, however, to a buyer for a big American mill, firm offers will bring out plenty of wood. There is, he said, no basis for a predicted shortage. True, little wood has been cut this winter, but there are ample stocks on hand.

Advices received in Montreal from India refer to condition of the paper market there and the advisability of getting lack to selling in sterling, following the example of all countries except Canada and the United States. Further fluctuations in exchange of course present difficulties, but the correspondent is of opinion that it might be possible for sellers of goods on this side on receipt of an order, and on ascertaining the shipping date, to be able to cover themselves for several months ahead, ensuring that when the money was returned against the drafts the sellers would be covered at the rate of exchange on which the selling price was calculated. The correspondent adds that it might also be possible for an agent to cover himself against rupees in sterling, and thereby it would be possible to quote a rupee price, both seller and agent being fuly protected. Business is no longer of a speculative character; the supplies which flooded the market are gradually being liquidated. The correspondent refer to the past crisis in India, and to the tremendous depreciation and heavy losses, adding: The situation now is that we know exacty what to do in the event of trouble, but the possibility of trouble is very remote owing to the fact that a man now buys with his eyes open."

Toronto Topics

Retail sales are still in quite small volume and this fact has a depressing effect on many lines of paper for wrapping and packaging.

Apart from newsprint, which is the bright spot at present, the general feeling is that April will not provide as good a showing as March. This is a confirmation of the view expressed in several quarters that the expected development of business in a general way has not really commenced. The present situation and that for the first quarter of the year has been one of stabilization rather than progress.

Conditions in the printing industry have an important influence on the situation. The question of prices for cuts is unsettled. Many catalog orders are affected in this way, owing to the large part played by halftones in this work. There is a pronounced tendency to defer ordering paper for higher grades of catalog work or to make lower grades do.

We mention that phase because it is typical of a number of minor related conditions traceable to an almost static industrial situation, which it is now thought cannot show marked improvement for some time. Influences are, however, at work that promise better things. There has been much business in bonds, but the demand has brought prices to a point where the yield is reduced, with the result that attention is diverted to other securities of more speculative nature, even those which are not in the dividend class. A recent day's dealings on the Toronto Stock Exchange passed the 20,000 share mark. These activities indicate the greater ease of the money market, and a stronger sense of security generally.

With regard to the new tariff putting 5 p.c. duty on chemical pulps going into the United States, opinion among pulp men in this locality is fairly agreed that the duty will be paid, if imposed at all, by the United States importer, that it cannot be expected that Canada would be any more disposed to export pulpwood even if there should be provided this quite aparent provision of a bargaining device. It is thought probable by some that this item of schedule 13 will pass one house, but be thrown out later.

Prices for pulp, paper, and materials are represented by the following notes:

GROUNDWOOD. — Prices vary from about $30.00 delivered for news grade, to about $40.00 for book quality. Prices are inclined to be nominal, depending on stocks in hand at mills and size of order. Concessions would probably be secured by any new business in fair volume.

SULPHITE. — News grade is about $65.00 delivered and book grade is about $75.00. There is no marked activity.

SULPHATE. — Around $70.00, with fairly quiet conditions.

BOOK. — Little or no change is reported.

WRITINGS. — There is fair activity showing, if anything, slightly increased business in all lines.

WRAPPINGS.—No. 1 Kraft 8 3-4c. per lb. Colored Kraft 9 1-4c. to 10 1-4c. per lb. Manilla 5 1-4c. to 7 1-2c. per lb.

BAGS. — Manilla 65 per cent off regular list prices. Light Kraft 65 per cent. Heavy Kraft 70 per cent. White Bond 45, 10, 10 per cent.

TISSUES and TOILETS:

Manilla	20 x 30	$ .85	24 x 36	$1.15 Rm
Nat. White	20 x 30	.95	24 x 36	1.35 Rm
No. 1 White	20 x 30	1.25	24 x 36	1.75 Rm
White Sulphite	20 x 30	1.10	24 x 36	1.55 Rm

TOWELS. — Interfolding $5.50 per case. I.X.L. Roll $15.25 per case less 22 per cent.

PAPER STOCK:

No. 1 Hard White Shavings	$3.75	3.85
No. 1 Soft White Shaving	3.20	3.30
Heavy Books and Magazines,	1.60	1.70
Ledgers and Writings	1.90	2.00
No. 1 Kraft	2.10	2.25
Newspapers,	.80	.85
No. 1 Mixed Papers	.55	.60
Cotton Rags No. 1	4.25	4.50
Thirds and Blues (repacked)	1.50	1.75
Roofing Rags	.95	1.00
New Cotton Cuttings	No quotations	
No. 1 White Shirt Cuttings	8.50	9.00
Fancy Shirt Cuttings	3.75	4.00
Canton Flannels bleached	6.25	6.50
White Lawns	7.50	7.75
Blue Overall Cuttings	4.75	5.00

ROPES and BAGGING:

No. 1 Scrap Bagging	.50	.60
No. 1 Manilla Rope	3.75	4.00
Mixed Strings	.70	.80

The waste paper market has suffered no change in the past week. The loss of production due to Passover and Easter holidays tends to make a quiet market still quieter. About the only line showing any activity was that of Books and Magazines, which were moving fairly well on demand across the line. Prices are unchanged from last week.

NEW YORK MARKETS

New York, April 15—(Special Correspondence)—Convention week as a general thing witnesses a slowing down of activity in the paper trade. With paper mill officials away from their plants to attend the annual gathering of paper manufacturers in New York City, and with paper jobbers from all parts of the country absent from their desks while in this city to attend the yearly meeting of their trade association, business naturally quiets to an extent. This week, however, there has been little indication of the paper manufacturers' and merchants' convention having any influence on the paper market. Business has gone along at a fairly rapid rate, and the situation has continued to show improvement. Figures cited at the gathering of paper mill officials in the Waldorf-Astoria Hotel in New York are highly encouraging, in that they indicate that activity in the paper producing industry is increasing and that the paper situation as a whole is gradually getting back to a more or less normal condition.

Leading manufacturers of fine papers told the convention that mills making fine papers are now operating at close to 80 per cent of capacity, which, when it is considered that at the same time a year ago the same mills were running only 29 per cent, shows how the fine paper market has improved. Statistics were cited by speakers at the convention to show that newsprint mills in the United States are running at around 85 per cent of capacity, that glassine and greaseproof paper plants are operating at 75 per cent, and that substantial gains in productive activity have been scored in recent months in the wrapping and tissue paper branches of the industry and in box boards.

The one dull branch of the paper market at present is the book paper division. Demand for book papers from various consuming sources does not begin to approximate that of normal, and book paper mills are reported mostly running at greatly curtailed output. The situation in book paper is not without its redeeming features, however. For example, the leading fiction periodical in the States added no less than 60 pages to its last issue, practically all of which was advertising. Also, the recognized foremost trade publication in its most recent issue added 40 pages. These two instances are sufficient to show that consumption of book paper is increasing, and not slowly at that but at a fairly rapid rate. Reports generally tell of advertising being on the increase and it seems likely that trade papers and fiction periodicals will soon be back to their normal size, which will mean that consumption of book paper will be back to levels where it belongs. In fact, demand for book paper at present is much better than it was up to short time ago, and most manufacturers are said to be operating their plants at somewhat larger production than earlier in the year.

Action in the box board market is quite pronounced and gives every indication of continuing. Paper box manufacturers are busier than they have been in a long time and are consuming board in good amounts, thus bringing them actively into the market as buyers. Quotations are unchanged at about $35 a ton f.o.b. New York for plain chip and $37.50 for news board, but there is a stiffening tendency to prices, and if demand keeps up at its prevailing rate it is probable quotations will be moved upward by producers.

GROUND WOOD. — There seems to be a moderately large movement of ground wood into consuming channels, and yet the tone of the market is not firm. This seems to be due almost wholly to the fact that better water conditions have enabled grinders to increase their production of pulp, with the result there is more ground wood available than in some time. No one appears to be pressing supplies on to the market or to be evincing an inclination to sell ground wood at what could be called sacrificed prices; on the contrary, manufacturers and dealers are quite firm in their price ideas and continue to quote former figures. With more pulp on hand at producing plants, however, and with demand of no broader dimensions than it has been, there is obviously a rather easy market undertone. Domestic producers quote around $32 a ton f.o.b. shipping points for prime spruce ground wood, freshly ground, for prompt shipment. Delivered consuming mill prices generally figure out at between $38 and $30 a ton, and f.o.b. grinding plant quotations depend largely on the freight between the two points.

CHEMICAL PULP. — Two important developments have occurred in chemical pulp this week. One of these is that, as has been reported in these columns would be the case, the revised tariff bill reported out from the Senate Finance Committee to the United States Senate carries a paragraph imposing a duty of five per cent ad valorem on chemical wood pulp imported into this country. Whether or not this provision will be allowed to remain when the bill is enacted into law is problematical at this time. It is no secret that there is a great deal of opposition to a tariff on pulp, and there is no doubting that those who favor keeping pulp on the free list will exert whatever influence they can command on the party leaders in Washington to have pulp removed from the dutiable list in the tariff act before it comes up before Congress for a vote.

The other important development of the week is the announcement by leading domestic producers of bleached sulphite of a cut in price of half a cent per pound from 5 cents to 4.50 cents f.o.b. pulp mills on No. 1 domestic bleached sulphite. This move on the part of United States pulp manufacturers came somewhat as a surprise, and yet a good many in the trade professed to anticipate such a reduction owing to the proportionately low prices at which foreign sulphite has been selling in this country recently. The new price of 4.50 cents on domestic bleached sulphite is retroactive to April 1 to contract customers; that is, contract buyers will be charged but 4.50 cents, instead of 5 cents, on all deliveries from the first of the current month.

The chemical pulp market exhibits little trade activity of note. There is a fair trade of regular character going through, but consumers are buying very cautiously, and it cannot be said that demand for any grade of pulp is brisk. Prices are well maintained on other grades than bleached sulphite, and it is not believed the cut in bleached sulphite will affect prices on other grades because unbleached sulphite, kraft and soda pulp have for some time been selling at relatively much lower levels than bleached sulphite.

RAGS. — Despite a comparatively slow demand for papermaking rags, there appears to be a firming sentiment in the trade. Dealers in general express a more optimistic opinion regarding the outlook and seem less desirous of entering engagements involving sizable tonnage of rags than they have been. The feeling prevails that, if all the reports concerning market improvement in the fine paper industry are true, paper manufacturers will soon find it necessary to come into the market for larger quantities of rags, and dealers and packers insist that normal stocks of rags are not now available. The policy most sellers consequently are following is to hold off in making important commitments and to content themselves with moving small lots of rags which come their way through regular channels of supply.

Roofing rags probably are in better demand than any other single class of rags, and sales are reported of No. 1 roofing stock at 90 to 95 cents a hundred pounds f.o.b. New York, and of No. 2 packing at 80 to 85 cents. Old whites are selling here and there in small parcels, and new No. 1 white shirt cuttings are meeting with a fair demand at around 10 cents per pound at dealers' shipping points. Old thirds and blues are dull and are nominally quoted at about 1.75 cents a pound for repacked stock, and 1.25 cents for miscellaneous blues.

PAPER STOCK. — Waste paper is wanted in medium volume by consumers. Certain grades, notably soft white shavings, white blank news cuttings, No. 1 mixed paper and old book stock, are moving readily provided dealers are satisfied to accept the prices mills offer, and other grades are in sufficient call to hold prices moderately steady. No. 1 soft white shavings show a strengthening tendency and most dealers in New York ask 3.25 cents a pound for this stock f.o.b. this city. Old No. 1 heavy books and magazines are quoted at 1.40 cents, white blank news cuttings at 1.65 cents, No. 1 mixed paper at 45 to 50 cents a hundred pounds, folded newspapers at 55 to 60 cents a hundred pounds, old No. 1 kraft at 1.75 cents, and No. 1 hard white shavings at 3.75 cents.

OLD ROPE AND BAGGING. — Old manila rope is in fairly good demand and prices rule steady at round 4.25 cents per pound for rope in No. 1 condition, with some mills reported paying slightly above this price. Old bagging also is steady in price at an average of one cent per pound at dealers' shipping points for No. 1 scrap bagging, and is wanted in moderate-sized lots by paper mills.

According to an official United States survey, reforestation in the country has resulted in the replanting by all agencies, Government, State and private, of an acreage totalling approximately 1,000,000 acres of trees. But this, it is pointed out, amounts to but one-fifth of the acreage cut each year in the various forest levelling operations. Of all the States in the Union, New York is shown to lead in reforestation. About five million trees are produced by the State each year for reforestation, and in addition thereto the large paper companies and railroads maintain private nurseries. From 1908 to 1920 the State planted 60,000,000 trees. In 1920 the State planted 8,000,000 trees and the private companies another 3,000,000. Massachusetts has also done some good work along these lines, and recently the State acquired 100,000 acres for reforestation purposes.

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MORE AND BIGGER NEWSPAPERS.

The revival in the demand for newsprint paper since the beginning of the year, and which has enabled most of the Canadian mills to resume production at nearly maximum capacity, is attracting much attention in paper-making and newspaper publishing circles.

"The remarkable push back of the newsprint activity is occasioned in large measure by the large metropolitan dailies whose editions are larger than ever before," comments the Paper Trade Journal (New York) in reviewing the situation. "In February 1921 the average issue of 62 of the metropolitan dailies in 21 cities contained 21 pages and increased to 23 pages in 1922. The average Sunday edition contained 77 pages in February, 1921, and 85 in February, 1922, showing an appreciable increase.

"While production of newsprint is gaining throughout the North American continent, publishers are eating rapidly into their stocks which, if the present demand continues, will soon be as low as in 1920, when a burst of activity struck the market. There is a strong tendency on the part of the phenomenan present during the 1920 boom to assemble again, and in anticipation of somewhat similar, yet milder and more lasting results, the newsprint trade is prone to assume an optimistic attitude."

Figures are given to show a greater and progressive consumption of newsprint for the first two months of this year over those of 1921 by newspapers reporting to the Federal Trade Commission and the conclusion is drawn that, "Since newsprint is such a large factor in the paper business, its betterment can only indicate that general conditions are working out for the good of the whole industry," and that, "there is a substantial basis for the growing belief that the paper line is out of the shadow and subject once more to the comforting rays of a sunny era." This, of course, necessarily applies also to the companies producing pulp only.

This diagnosis of the industry is further borne out by many corroborative facts. Cheaper and more abundant newsprint has led some American newspapers to reduce their retail selling price and while this is regarded by a majority of the publishers as an extremely doubtful policy it cannot but eventually help to swell the demand for paper. The current issue of a publishers' trade paper reports that the four daily newspapers published in Springfield, Mass., have reduced their selling price from 3 cents to 1 cent a copy. Increased circulations are reported. A Concord (N.H.) daily newspaper has reduced its selling price from 3 to 2 cents. The daily newspapers of Cleveland, Ohio, and St. Louis, Mo., have all been reduced from 3 to 2 cents a copy. New newspapers are also beginning to make their appearance. This week the New York World announces a new pictorial daily edition and a new daily has been started at Burlington, N. C.

Circulation returns for the New York City dailies for the six months ending March 31st total 3,659,048 copies, an increase of 91,000 over the corresponding period of a year ago.

A Canadian advertisers' annual, just issued, states that the circulation of all Canadian daily newspapers combined now amounts to 1,774,519 copies, an increase of 15,000 over last year. Canadian daily newspaper circulation has for many years kept pace with the growth in population although during the war years, suspensions and amalgamations reduced the gross total. The publishing business in Canada, as in the United States, appears now to have definitely turned the corner once more and to be on the upgrade.

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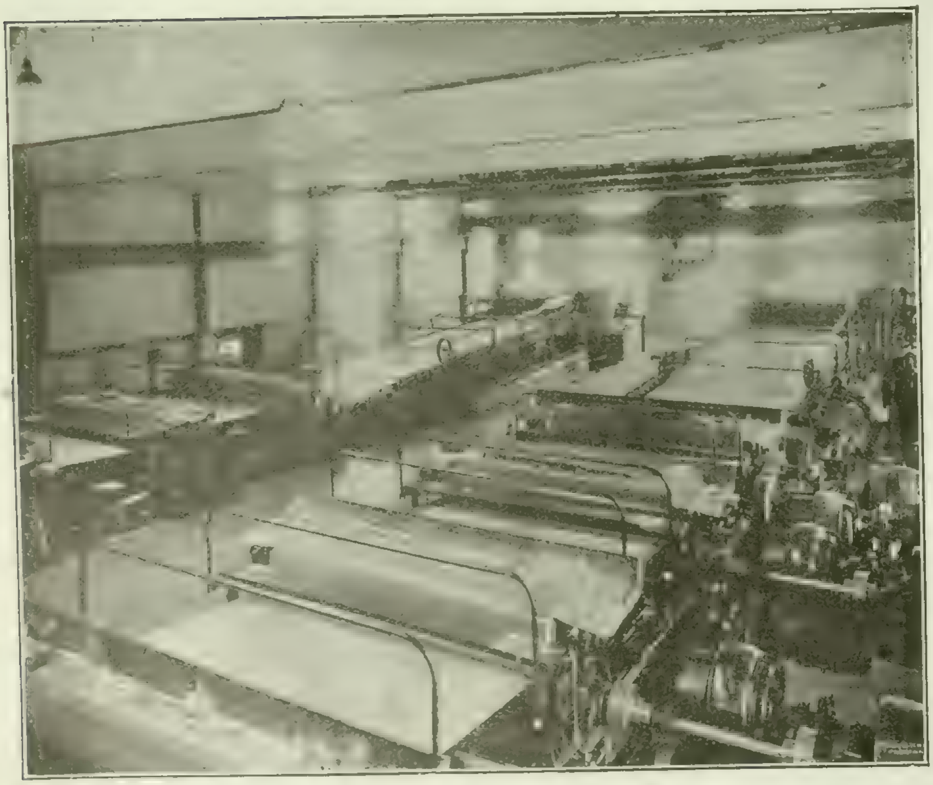

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Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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:-: EDITORIAL :-:

ON THE TRAIL OF THE ENEMY

It is curious and interesting to consider the various ways of locating an enemy. The two extremes may probably be represented by the use of a telescope in one case and a microscope in the other. Both of these instruments are important factors in fighting enemies of the pulp and paper industry. The telescope is used by the ranger in discovering and locating forest fires and the microscope in identifying the minute organisms responsible for the molding and decay of both mechanical and chemical pulps.

The progress that has been made in the microscopic study of enemies that work in the dark to destroy the substance and the value of products manufactured at great expense, such as the various grades of pulp, is truly remarkable. It is unfortunate that manufacturers and users of pulp have not yet come to realize, at least not fully, the important service that the scientist with the microscope is rendering by the quiet pursuit of the elusive organisms that are responsible for an enormous amount of destruction. It is unfortunate also from the standpoint of the scientist as regards the completeness of his work and encouragement for carrying it on, that there is not more cooperation on the part of the manufacturer.

This is no doubt largely, if not principally, due to lack of acquaintance and contact between the scientist and the manufacturer. For instance, the work now under way at McGill University is probably typical. We were not aware until this week, that under the direction of Prof. Carrie M. Derick, of the Department of Botany, that two graduate students assisted by grants from the Honorary Advisory Council of Industrial Research, are studying this problem of micro-organisms and their effect on the quality of pulp. For the completion of this work, a large number of samples are necessary. We wish to commend the investigation to the attention of all the pulp mills in Canada and to urge them strongly to collect all available samples of infected pulp and forward them to Prof. Derick. They should be carefully marked as to age of the pulp, conditions of storage, and any other factors that might possibly influence the source of infection, the rate of growth or the present quality of the stock. Freshly molded samples are particularly desired.

Bad temper is like the fabled scorpion that stings itself. The poisoned sting of anger strikes deepest in our own souls.

WAGES AGAIN!

Before this paper in is the hands of readers, there will have been a conference between paper manufacturers and representatives of the unions on the subject of a wage agreement for the year beginning May 1st. The manufacturers suggest a reduction of 10 per cent in the wages of skilled men and that ordinary labor be based on local conditions The present prices of paper, in many instances, do not cover the cost of manufacture. The public is not in a mood to pay higher prices and if a product cannot be sold, it is useless to make is—and it cannot be produced at a loss. Stoppage of sales means stoppage of work, and no wages. This situation argues for a decrease in production costs—which is largely a matter of wages—to a point which permits a fair profit on invested savings.

With regard to ordinary labor, we feel that wages should be based on local conditions; not local conditions of surplus of labor that force a man to accept less than a living wage in order to get the job from a fellow man and merely keep himself from starving, but that local living conditions and costs should form the basis for the wage scale with variations according to individual ability and the character of the work.

COBWEBS

In the Pulp and Paper Magazine for April 13 we printed two articles from the Newsprint Service Bureau Bulletin, without giving them due credit. These articles, "Waste Bark for Fuel" and "Stop Leaks", were both written by Mr. Bearce of the Bureau. They have attracted much merited attention.

Nine orders in one day is the record so far for volume 3 of the Textbooks. This volume contains 702 pages and over 250 illustrations, making it the most comprehensive book on the *Manufacture of Pulp.* Of course it is the best. It was written by six American and six Canadian authors. This is the best value to be found for five (5) dollars.

As we go to press, word is received that the Union leaders have rejected the proposal of pulp and paper manufacturers for changes in wage scales and that the manufacturers will insist on the conditions proposed.

A despatch from Sherbrooke says that the "Old Mill" of Canada Paper Co. is to be closed in accordance with the demands awarded Mr. Brown and that the plant may be used as a foundry.

Conditions in the Newsprint Industry*

In view of the great amount of important work which is to be done and the limited time which can be devoted to it, I shall be very brief in my remarks; I shall simply touch a few of the high spots, more particularly with reference to the newsprint industry.

The newsprint industry is probably passing through the most critical, the most difficult period in its history. Notwithstanding the enormous reductions we have made in our inventories, I think it is a fact that with paper selling at the present prevailing price of three and one-half cents, every newsprint mill in the country, with the exception of two or three very small ones, is losing money, and losing heavily. The causes for that, I think, are simple.

The primary cause is overproduction. The capacity of the American mills has grown from about 2,100,000 tons a year (including the new mill started the day before yesterday by the International Paper Company of Three Rivers) to a capacity above 2,700,000 tons; in other words, there has been an increase in the capacity of the mills on this continent of about 600,000 tons a year in a very short period of time. It is true that the consumption was very high during the war, but it never exceeded the supply.

In 1920 there were in this country, as nearly as we can ascertain, 90,000 tons more paper available than was used. The spot market prices were created largely by the fact that a few large publishers accumulated that paper and carried it in stock and robbed the market, and permitted the little brokers and dealers and profiteers to take advantage of the situation.

Why is it that we are suffering today? Primarily it is because of the effect of this increased capacity, but mainly it is because we have in our ranks a large number of cowardly and selfish men! Now, I speak advisedly when I say that. While certain mills in this country are running at 60 p.c. capacity, others are running above their normal maximum capacity. If the manufacturers of this country (I am referring now only to news) had considered, had ascertained, as they can so readily, what the normal production was, the capacity for production, and what the consumption was, and they had been willing each to take their reasonable share of that business, so that business, so that although running under capacity they could keep out of bankruptcy and keep their plants in motion, the result would have been what? An ample supply of paper for the publishers; the market would not have been robbed. On the other hand, it would have meant that we could have maintained for our paper (operating indidually, studying the conditions, each man determining himself what was far and what was right, what would give him a reasonable return on his investment) a price which, if it had not given us a profit this year and last, would have greatly minimized our losses.

Now, it is because of the selfishness of the people in our own ranks, that we are in this trouble. Gentlemen with a mistaken shortsighted view, not looking to the future, not considering the ultimate effect of what they are doing, rushed into the market and were willing to accept almost any price that would fill their mills to capacity, and particularly one or two of the Canadian mills are running night and day beyond their norml capacity. What happened? What would happen if you were publishers? The publishers have sandpapered the manufacturers one against the other, (to use an English expression) and when contracts were sought, they would make one manufacturer bid against another; so the price has been forced down and down and down, till today three and one-half cents is the generally prevailing price and we are practically all losing money; we are losing very heavily, some of us. In the Company with which I am connected, they are losing money at three and one-half cents on the average, although we charged on our wood accounts last year over $6,000,000.

As to the remedy, I think the principal remedy is for the manufacturers to study the conditions, to study the facts, to see what the demand is, and fix their prices so that they will give them a reasonable and adequate profit, and at the same time treat the publisher fairly. Any condition under which the publisher temporarily obtains paper for less than it costs to make it is injurious not only to the paper industry but is equally injurious to the publisher when the readjustment comes, as it inevitably will come.

Of course, this last year we have been faced with some very unusual conditions. My recollection is that about 130,000 tons of paper have come in from abroad; but when you consider that our consumption last year, in round figures, was almost 2,000,000 tons, it was a very small percentage and should not have disturbed the market, and would not have disturbed the market if we had had the courage to stand to our guns and insist upon a price that would give us a reasonable return, an honest return, a proper return, a lawful return, on the money that we had invested.

Outlook Is Brighter.

I see a rift in the clouds, however. I am in pretty close touch with some of the industries on the other side. The possibility of sending that foreign paper into America will disappear in time. I think in the course of a very few months we will find that Germany and Scandinavia will be unable, or at least will find it undesirable to send into the American market paper in such quantities as they have in the last year or two. The German publishers have recently co-operated in protesting to the German government because they were unable to obtain the amount of paper necessary for their publications. This present German government, which is just as arbitrary as that of Russia was before the war, (and I have been on the ground and therefore speak advisedly) simply compels these people to export a certain part of their paper. Of course, they do that for two reasons: First, they want to send it to countries in which the exchange is in favor of Germany and it is advantageous for that reason; and secondly, they had an export duty levied by the government which is applied partly to pay their indemnity, so the government is directly interested in their exporting of paper. However, the wages are descending and I think in the course of a year or two the importation news will be negligible. I think that will be especially so if Russia gets on her feet.

Speaking of Russia, I want to say there is nothing in this world so important to us as that we should enable Germany to get on her feet, that she may pay her indemnity and that with English capital to aid her, she may put Russia back on her feet. When that comes,

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* Address by Mr. Philip T. Dodge, President of the International Paper Co., at the annual business meeting of the American Paper and Pulp Association, New York, April 13, 1922.

(and I belive it will come more speedily than we expect) we are going to have an improvement there that will be reflected upon this country, and I look then for a period of very great prosperity.

Now, as to this newsprint, I believe that when the manufacturers come to review their books, to study their balance sheets, they will find that it is absolutely necessary that they should hold to the present prices for a considerable time, or perhaps make them somewhat higher.

Another of the evils which exist among the manufacturers is dishonesty with each other; paper is being sold, contracts are being made at three and one-half cents, mill delivery, and then secret rebates are allowed, adjustments of freight, allowances for paper delivered and paid for in the last year. I know of an instance in which some thousands of dollars were allowed to a newspaper that had closed its accounts for last year. They are compelled to pay the market price, the contract price for their paper for this year, but they are given credit of a good many thousand dollars on that account that was closed for last year, and in that way they are getting in effect a secret rebate.

Now, I think, gentlemen, that it is of interest to all of us that we should make our prices open, that we should adhere to them, whatever they are, and do it honestly.

Why the Newsprint Industry is Unprotected.

Of course, the manufacturers in the United States are at a very great disadvantage in several respects as compared with the manufacturers in other countries. Newsprint paper is practically the only paper without protection; it is made from the same material as many other papers, with the same class of labor; to an extent on the same machines, but the markets of the world are open to our competitors. Paper made from governmental wood in Europe, by men who receive in many cases less than half the wages that we pay men for similar work, comes into the United States free. Just across the border we have our Canadian friends; their manufactured product is permitted to come in free, and at the same time they are permitted to prevent, to cut off, to arrest the supply of wood to the United States mills under leases which were made (and paid for very heavily) with the distinct understanding that wood was coming into United States mills. Under those leases, the wood did come for years; the Canadian authorities were not only glad but anxious to have it come, and urged the American manufacturers to increase their mills and increase the importation of that wood, into the United States and in a day almost, realizing that it was advantageous to develop their home industries, they forbade the further exportation of that wood to foreign lands; but their manufactured product, made in Canadian mills, employing Canadian labor, paying taxes into the Canadian treasury, is permitted to come in free.

And why is it? Well, when we consider who the consumers of this papers are, how many men there are in our legislative halls who are the owners of, or are largely interested in, newspapers, and when we consider that pretty nearly every one of those men is looking forward to the next election to see what the local conditions are and how he must guard himself at the ballot-box, we can understand how it is that when a publishers force them down by making them bid one answers. That is what we have to face, and how we are going to escape it, I don't know. Of course, we are hopeful of a duty, but I have not the slightest idea ported, with possibly slight modifications, we could we will obtain it. I believe we will find that when Congress adjourns, there is no protection on newsprint paper. All we can do is to study the economies, work as hard as we can, manifest a spirit of cooperation and mutual regard; do all those things which the law will permit us to do for the general good.

If each manufacturer would take his share of what is to be consumed, and if they would all hold to prices that are fair and reasonable, instead of letting these publishers force them down by making them bid one against the other, I believe the industry would come back within a reasonable time to a good, sound condition.

The consumption of paper is increasing; this country is growing; our exports are cut off because of the exchange, but as the world conditions are rectified and the exchange is again equalized and comes back toward the normal so that other nations can do business with us, it will be possible for us to re-establish our exports, I think. It is not coming today; it is not coming tomorrow, and it never will come unless we stand together and work together along legitimate, logical, legal lines of co-operation!

Mr. Philip T. Dodge

A Word About Wages.

One of the difficulties that we have been passing through this past year (and this reflects what our Chairman said about co-operation in our lines, and the great necessity for it) is the matter of labor. In most of the unionized mills the contracts expired on the first of last May. Wages were high; men were receiving two to two and one-quarter times the amount that they received in 1913 and 1914. Costs of necessities were falling and the day wage had a much greater purchasing power than it had in 1908. Before those contracts expired, fearing that there would be some difficulty with labor and having intimations from the leaders that they proposed to readjust prices upward instead of downward, I succeeded in getting together the representatives of seventeen or eighteen newsprint mills. We appointed a committee, with power to frame wage scales and working conditions. It was our intention, our expectation, that when that committee re-agree on those things, and that we would all stand for that scale and for those conditions.

Five weeks went by and nothing was done. They were called together again in New York at the end of that time, and then it was suggested that perhaps if we waited another month perhaps the labor leaders might have something to suggest. By that time , the mills were down; nothing was done. Sixteen or seventeen of these people went off from the meeting and entered into an arbitration that is going to lead to endless trouble; and the International Paper Company was compelled to make that fight, and we have made it! We shut our mills down for months, but today we are running our mills on the American Plan. Every mill that we have is run on the American Plan. We deal directly with our men; we pay them, as we always have paid them, the highest prevailing wages; we give them the shortest prevailing hours; we look after them in various ways, as we have always done, but we are managing our own business and we are not submitting to the dictation of Mr. Carey or any third party, no matter who they might be.

And I want to say (perhaps it is inappropriate) that so long as I occupy the chair I do in that Company, no union leader will be permitted to put his foot across the sill of one of our mills! We will deal directly with our men. We believe in shop committees, committees made up entirely of our employees.

An interesting little sidelight in this matter is that in the mills we are operating today, we have all the labor we desire; the good and reliable labor, and we are getting a larger tonnage per capita than we ever did under union regulations; and certain charges, which were present over a period of years, a charge of practically $2.66 per ton on all the paper we made, have disappeared under the new arrangement. I believe in treating labor fairly, in giving them a living wage, doing all the things we can to make life not only tolerable but enjoyable -- but I am unalterably opposed to the intervention of third parties, governmental or otherwise.

Gentlemen, I have wandered far afield, I can say only in conclusion that I believe that all we have to do is to keep cool, keep our heads, not become hysterical, study the conditions, and hold our prices for paper at the point and at a level which will enable us to at least break even, until there is an improvement in general conditions.

Now, the consumption of paper is increasing. I believe it will continue to increase. Before the war for several years the total consumption of this country increased from six to seven per cent. I believe we will have a return of that condition. The country is growing; there will be an increase in the amount of printing; if we will only keep our heads and not allow ourselves to be stampeded by the publishers, I believe that the newsprint industry will get back on its feet in the not distant future.

PAPER CLUB ELECTS OFFICERS

The Montreal Paper Club has started another year with the intention of enlarging its scope and of securing a much larger membership. The Club has been doing excellent work, but it has not attained the membership which it deserves, particuarly when it is borne in mind that the purposes are:

To bring about wider acquaintance amongst those engaged in selling of paper and paper products; to assist in raising the efficiency of selling methods; to promote development of the highest sales ethics among its members; and to increase the use and sales of paper and paper products.

To secure this extended membership, By law No. 3 was amended at the annual meeting, held at the Queen's Hotel, Montreal, on April 18, under the presidency of Mr. E. T. Reynolds. This rule now reads: MEMBERSHIP.—Any salesman, sales manager or advertising manager or other individual directly and actively employed in the sales, sales promotion or buying of paper by concerns manufacturing, merchandising and converting paper (including printers, lithographers, rulers, embossers, bookbinders, advertising agencies, and also buyers of paper for any purpose shall be eligible to make application for membership. Application for membership shall be referred to the Committee on Membership, which in case of dispute shall confer with the executive whose decision shall be considered final. In the event of a member severing his connection with the buying or selling of paper as above defined, his membership shall automatically cease.

The alteration was made on the motion of Mr. P. Burns, seconded by Mr. R. M. Maclean.

The President explained that its object was to enable customers of the salesmen to become members, was increasing the usefulness of the club.

The report of the secretary (Mr. T. M. Hubley) showed a membership of 61, of which 45 are in good standing. The receipts were $90.45 and the balance $54.79.

The election of officers resulted as follows: President, Mr. R. M. Maclean, proposed by Mr. A. L. Dawe, and seconded by Mr. Hall; vice-president, Mr. S. Rodier, proposed by Mr. Maclean, seconded by Mr. Burns; executive committee, Messrs. A. L. Dawe, I. Dyer, and W. R. Currie. Mr. Reynolds was also nominated as president, but declined to stand.

Mr. Maclean in returning thanks for his election, insisted upon the necessity of more members. The officers had done a lot of hard work, but more support must be given by the trade. He suggested a membership committee to secure additional members.

The suggestion was approved, it being left to the executive to appoint the committee.

Mr. Rodier also referred to the necessity of a greater membership, pointing out that the objects of the club were beneficial to the industry.

Mr. Reynolds thanked the outgoing executive for their co-operation and also the secretary. He endorsed the idea of securing more members.

A brief discussion as to the advisability of holding the meetings in the summer followed, this will come up at a later meeting.

Mr. J. Home suggested that a picnic be held during the summer, the program to include sports. He then pointed out how the club could promote more co-operation between manufacturers and jobbers, and could also bring the salesmen closer together. There were, he said, subjects of great interest to the trade to be discussed. Everyone thought he could sell paper—an advertisement for a salesman would bring answers from people who had sold liquor and a number of other products which had nothing to do with the paper trade. The analysis of sales was a subject which could be discussed with advantage, not only the amount of sales, but the different lives. Let them discuss such questions as these which were closely associated with their business.

At a subsequent meeting of the executive Mr. Hubley was re-elected secretary.

The Importance of Trade Association*

The Forty-fifth Annual Convention of the American Paper and Pulp Association is a fitting time to make some comments on the growth and importance of trade associations in general and the American Paper and Pulp Association in particular.

These comments with some brief remarks on business conditions, past and present, and a briefer glance at the future, will comprise what our Secretary has chosen to designate on the program "The President's Address."

I wish to pause here long enough to pay a tribute to my predecessor in office, Mr. George W. Sissen, Jr. His administration will long be remembered by the very able, annual addresses he delivered. They rose to the rank of real state papers. I commend particularly to your careful re-reading his address delivered one year ago.

The ability to organize into groups for political and social betterment, marks the difference between the human animal and the lower forms of animal life. Almost as far back as the beginning of written history there are evidences of trade associations. You will recall that the Apostle Paul had trouble with the Silversmith's Craft of Ephesus, and their eader, one Demetrius, proposed to silence him, charging that his teaching hindered the sale of their product. This was at the very opening of the Christian era.

Medieval Europe saw the rise and fall of the Guild System, and now in these latter days we are witnessing a very important development in National Trade Organizations.

There are at the present time about one thousand trade organizations in the United States. Approximately two hundred of these are national in their scope and activities. This large growth is strong evidence that the modern business man has at last learned that **co-operation** and not **competition** is the real life of trade. Mr. Emmet Hay Naylor in his recently published book on Trade Associations states this very clearly as follows:

> "The modern trade association is one result of the business world's realization that unrestricted competition is unnatural and fallacious and that constructive, intelligent competition, together with studied co-operation, is not only desirable but essential to industrial welfare. ...The old conception was that industrial success was built on the failure of others; the now conception is that every failure in an industry is felt disadvantageously by every number of that industry and by the consumer as well, and that the temporary profits enjoyed by the victor generally cannot offset the damage and retrogression suffered by the industry as a whole."

Co-operation of the right kind does not destroy healthy competition. It does, on the contrary, encourage fair competition by giving the business executive accurate knowledge of trade conditions. This knowledge he can use for constructive purposes in his own business without destroying the business of his neighbor. Someone has recently said that the modern business world needs

"Co-operation regulated and not competition compelled."

Large corporations or so called "Trusts" are manifestations of man's desire to obtain the benefits of cooperation; the practices of some of them may have gone beyond the bounds of good morals or proper legal limits, but this fact of itself is not a valid argument against the principle of co-peration.

The importance of trade organizations and co-operative methods are being recognized in high places. Mr. Herbert Hoover, Secretary of Commerce, in his recent correspondence with Attorney General, Harry M. Dougherty, said:

> "It is with much earnestness that I claim there is propriety, generally speaking, in trade associations. Their lawful field of endeavor is large, and their activities work for promotion and advancement of the public welfare and for progressive economic organizations."

Mr. Justice Brandeis and Mr. Justice McKenna in their Dissenting Opinion on the Harwood Lumber case, said:

> "Intelligent conduct of business implies not only knowledge of trade facts but an understanding of them. To this understanding editorial comment and free discussion by those engaged in the business and by others interested are aids. Opinions expressed may be unsound; predictions may be unfounded; but there is nothing in the Sherman Law which should limit freedom of discussion, even among traders."

This dissenting opinion was concurred in by Mr. Justice Holmes.

In my opinion the development of trade organizations along proper lines has been a great step in advance and points the way toward the proper use of the principles of co-operation, in contrast to the old pools and trusts. As the Reserve Bank System, by creating co-operation among the individual banks, prevented a financial panic, so I believe the national trade associations, by encouraging co-operation among their members, have prevented industrial disaster.

The American Paper and Pulp Association has kept pace with the modern development of the organization idea. Organized in 1878 it has had a long and useful career. There are only three older national associations. It is interesting to know that the oldest trade association in the United States is the Writing Paper Manufacturers' Association, which was organized 1861. The American Paper and Pulp Association's form of organization has changed as conditions have changed, which is an evidence of life and growth. In its present form it is a federation of twenty affiliated associations, and sections, each active in its own feld, but all working together on larger general matters. As conditions change, the form of organization should continue to change.

Mr. Sisson, in his address last year, suggested that a committee be appointed to study the present form of organization and suggest improvements. This committee was appointed and will report today certain changes that we believe will strengthen the organization. The American Paper and Pulp Association desires, and we believe deserves, the hearty support of every manufacturer of paper and paper products.

Business Conditions.

It would serve no good purpose to go over in detail the history of the last year and the year before. It is sufficient to say that they were the two worst years the paper industry has seen in a generation, but they are behind us and we can look forward to the future with courage unimpaired. It has been a source of great satisfaction to me that I could occupy the office of President during one of these trying years. It has brought me into intimate relations with many of you who have been bravely bearing the burden and heat of the day. Surely the men of the paper industry are good loners. I have seen men facing large losses from month to month with stout hearts and smiling optimism, and never a one who was really discouraged or disheartened. I have come to think of these years as years of gain instead of loss. After all, it is not the greatest success to make much money, the real success is the building of character. What does it count if we have lost a few dollars; we have gained courage, hopeful optimism, confidence in ourselves and in our association. These are the things that enrich life. Ruskin once said that,

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* Address of Mr. Walter J. Raybold, President of the American Paper and Pulp Association at the Annual Meeting, New York, April 13th, 1922.

"A hundred men can talk where one can think. A thousand men can think where one can see. To see cearly is poetry, art and religion."

He might well have added:

"To see clearly and act courageously are the two essential principles of a successful businessman's life."

These years have proven that we have many men of this character in the paper industry.

There are great signs of encouragement for the future. Building is starting up in many centres. Nonemployment is decreasing. Railroads are increasing their earnings, and are coming into the market for new equipment. The price of agricultural products is advancing, thus increasing the buying power of a large part of the population. The steel business has steadily improved and is now on a basis of 75 p.c. tonnage, which is more than equal to 100 p.c. product before the war. Foreign exchange is improving. The banks are in good condition, so that money is available for new enterprises.

Our own industry has been thoroughly liquidated, both as to costs and selling prices. Stocks are low in the hands of merchants, printers, and the public. The mills at present are receiving orders at the rate of fully seventy-five percent of normal capacity, all of which is being consumed. A small movement all along the line to build up stocks would soon put the mills on a one hundred percent basis. This is bound to come in the near future. So let us forget the things that are behind and press forward with courage to the better things before, with full confidence in ourselves, our associates, and our associations.

EMPLOYMENT IMPROVES

It is gratifying to note an increase in the pulp and paper and publishing industry, where the 459 concerns reporting show that they employed 44,620 persons, during the first two weeks in March, as compared with 44,249 at the end of February, says the Department of Labor. Practically all of this increase of 371 employees, or nearly one per cent., was reported by pulp and paper plants, there being a minor decline in employment in the printing and publishing trades. Ontario and Quebec absorbed the majority of the additional workers employed during the fortnight under review, while in British Columbia there was an eight per cent. reduction in staffs. This group has shown considerable fluctuation since the beginning of the year, but the tendency on the whole has been favorable.

MOST OF CANADA'S WOOD PRODUCTS EXPORTED

That the average Canadian has not yet realized the bearing of the Canadian forest upon the future growth of the country is well illustrated by the annual plague of forest fires which in Ontario and Quebec alone ran up to 3,000 conflagrations in 1921 with a total of probably $15,000,000.

The timber supply situation in Canada is best estimated by examining United States conditions, for while Canada possesses abundance of timber to supply her own population indefinitely, the fact cannot be overlooked that it is the export to the United States that keeps alive probably nine-tenths of all the wood-using industries in the Dominion. In normal times only about ten to fifteen per cent of the paper production of Canadian mills is used in the Dominion and not more than one-sixth of the total lumber cut of Canada is consumed within this country.

The growth of the pulp and paper industry in Canada has been prematurely forced by the relative scarcity of pulpwood areas in the Eastern States and the recognition on the part of American corporations and investors that the passing of time was certain to increase the handicap of the American newsprint manufacturer. Efforts at reforestation are yet in the swaddling clothes stage and even allowing for vigorous reforesting efforts during the next five or ten years the wood crops resulting therefrom cannot prove of use to the American industry for at least fifty to sixty years. Meantime the newspaper press of the United States must have raw materials for about thirty million newspapers every day. If the paper mills of the Eastern States have, as is plain, less than ten years wood supply, the deduction follows that paper making will continue to shift its centre of gravity north of the Canadian border.

The war time census of wood supplies in the State of New York, maintains that less than ten million cords of spruce remained in that region and that as the annual cut in New York State is about 500,000 cords, 20 years at the present rate of consumption will exterminate spruce as a commercial factor. For the whole of the New England states, where the American newsprint industry is now concentrated, the most liberal estimates do not give the industry a life of more than eighteen years and long before the termination of that period the complete domination of Canadian paper mills over the American market will have made itself felt.

Fire Prevention is Vital

As the pulp and lumber supplies of the great consuming market south of the Canadian border display a more and more drastic depletion the strategic position of Canada's forest should warrant the Canadian people in insisting that the protection of such valuable national property from the present inroad fires should be raised into the front rank of public issues.

SEVENTEEN GRINDER LINES OPERATING

The seventeen grinder lines in the Abitibi mill are now complete. No. 12 line, hydraulic, was started up last week, and No. 13, electric, is ready for operation.

In the old mill there were ten lines of grinders and since the completion of the new mill the installation of the twenty-one new machines has been going on, and is now complete. The total is 51 grinders.

The first logs of the 1922 drive of the Abitibi Company came through the sluice at Twin Falls on April 11.

Transactions of the Technical Section.

Discussion of Papers at Annual Meeting

SAVING MONEY ON STEAM

(Continued from last issue.)

One of the interesting and encouraging features of the Technical Section Meeting, this year was the number of comments which came in by mail, following the appearance of Mr. Weldon's paper. These are summarized in the following. Members of the Section might well make more use of the Pulp and Paper Magazine for bringing up a consideration of matters in this manner. — Ed.

In reply to letters from Mr. D. L. McLEOD, of the Service Division Abitibi Power and Paper Co., and Mr. J. E. W. WARNER, Assistant Engineer, St. Maurice Paper Co., Limited, Cape Madeleine, Que., Mr. WELDON amplified several points in a letter, as follows:

Specific Heat of Paper. As you say, the specific heat of paper was taken as 0.31. There is an assumption in the use of this figure, i.e., that the specific heat of paper made from wood fibre is the same as wood fibre. The only data which I was able to obtain regarding this was taken from Bulletin No. 110 of the United States Forest Service, in which Dunlop gives the specific heat as:—

$$0.266 + 0.00116t \text{ at } t \text{ deg. C.}$$

which gives 0.31 as the mean specific heat for the temperatures with which we are dealing. I hesitated somewhat in using this, but finally did so, as the probable error in its use would not appreciably affect the final answer, unless it were taken out beyond these siginficant figures.

The assumption used herein is that specific heat of paper made from wood fibre is the same as wood fibre. However, the result which would be obtained from the use of this formula as it stands would probably not contain an error exceeding one per cent, or the accuracy of the result is well within the accuracy with which the necessary observations in regard to temperatures and relative humidities can be made with ordinary apparatus. The result as shown, which will be obtained from the use of this formula, represents not a purely theoretical result but a practical ideal such as might be worked to for any given machine room, for you will note that it takes into account the local conditions in its solution. On the other hand, it does not take into account the controllable conditions with regard to the use of the steam itself.

Specific Heat of Air. The specific heat of air, as used in the original formula, was taken as 0.2475, which is included in the constant 1732.5. On checking up the source of this figure I find that an error amounting to perhaps one half of one per cent has been introduced here as the mean specific heat, for the temperatures with which we are dealing should have been taken as 0.2420, with a 29.92″ barometer. Marks' Handbook gives as what is probably the most authentic determination of the specific heat of air that of F. G. Swann which is—

$$0.24112 + 0.000009t$$

which gives the figure mentioned above.

MR. MCLEOD then wrote: Considering further your interesting formula for theoretical steam consumption in the dryers of paper machines, and one or two points have come up that seem to me to be worth considering. There is a question in my mind whether we should include the heat necessary to heat the air going out the stacks, for while this must be taken into consideration there are so many variable factors that it is difficult to know just where to draw the line.

It seems to me that in this formula there are two variables, namely, t_2 and G_2, which cannot be definitely fixed since they depend on the amount of air passed through the machine, or in other words, on the speed of the ventilating fans. The formula either assumes that they are constant or else assumes that the amount of heat carried out by the air is a constant regardless of the volume of air. This is not strictly true since at lower temperatures the heat flow will be larger due to the greater difference in temperature between the inside of the dryers and air passing through the dryers. Therefore, theoretically G_2 should be kept at a point as high as possible, which will also increase t_2 but the fraction—$\frac{t_2}{G_2}$ will be decreased since G increases very largely for any given increase in temperature. Now, increasing the humidity of this air by cutting down the volume of air will also increase the temperature necessary in the dryers, or in other words the back pressure which will again tend to increase the air temperature and so increase the heat loss due to this cause.

There may be some other points which have not occurred to us but this will explain our hesitation in including the heat necessary to heat the air in theoretical steam consumption. Undoubtedly, there will be a given set of conditions which will be an optimum for any given paper machine, but in our opinion this would have to be determined directly by experiment rather than from a theoretical consideration.

MR. WELDON replied to this letter: I am afraid that you are under a little misapprehension as to the formula for Ideal Steam Consumption. This formula, while of more or less theoretical derivation, is not a theoretical formula which can be used without any reference to the practical considerations which enter into its use. In order to use it, one must make the necessary observations practically, to substitute in it for the variables, which remain variables until such a substitution is made; and, when this is done, one obtains for a result the practical ideal of steam consumption which exists for the paper machine and room considered, thus making the necessary allowances for paper and ventilation as it exists.

Mr. WARNER raised a question further in regard to Mr. Weldon's equation and the example given.

Mr. Weldon said: From a theoretical point of view, yourcriticism of the omission of the change in the heat content of the water vapor in the air as it enters the dryers can be justified. On the other hand, what we are primarily and fundamentally concerned with is practice and practically the heat change to which you refer is somewhat minute, don't you think?

In the problem which was cited, some 37.2 lbs. of air were required to remove the vapor generated by the drying of one lb. of paper, and the total heat change of the initial vapor in the air for the 37.2 lbs. only amounts to 7.6 b.t.u's., and its effect thus on the result to be obtained from the equation for ideal steam consumption is just about 3/4 of one per cent. This is an effect which no steam meter such as is ordinarily used to measure the steam to the dryers would register, an effect which, if you solve the equations on your slide rule, you are unlikely to find, an effect which is more than offset by the inaccuracy of the determination of the moisture content of the paper, due not only to the variations in the moisture content of the paper itself, but to the difficulty of obtaining a truly representative sample, and it is also an effect that is well within the accuracy with which the temperature and humidity readings could be obtained for the air entering and leaving the dryers.

Mr. D. M. CHURCH of the Terry Steam Turbine Co., makes the following comment:

I would like to call attention, to the fact that it is not necessary to use a turbine having a water rate so high as the 38# per electrical horsepower which Mr. Weldon gives in his tabulation at the top of the second column on page 49. The Terry Steam Turbine Company with which I am connected is ready to offer a turbine to work under the steam conditions given which would give a water rate of 32# instead of 38 without going to excessive speeds or involving an expensive or complicated machine which would not be justified on such work. On the other hand the water rate of 21# named for the engine would require a thermal efficiency of approximately 75 p.c. for the engine which is very near the top notch of engine performance and would require a highly refined engine in exceptional condition to produce.

In reply to Mr. Church's letter, Mr. WELDON says:

With regard to Mr. Church's remarks I hardly think he took into account the full content of the paper. The line of demarkation between the two types of prime movers is not nearly as distinct as his letter would tend to show and, contrary to generally accepted ideas, a poorer engine than the one chosen would show up much better against the turbine, when one steps past purely thermodynamic considerations to Dollar considerations. The engine used for comparison was, as Mr. Church says, a very superior engine, and such an engine was chosen to compare with the turbine because it was found that this high class engine and low class turbine represented the two extreme conditions.

I am very glad to note that Mr. Church's company produce a better turbine than the one considered; but without the cost figure, it is, of course, impossible to say where such a turbine would stand with regard to the diagrams for comparative annual cost.

It is impossible to be over-emphatic on the danger of too much generalization on such a subject, and each problem must be considered on its respective merits.

This ended the discussion of papers.

PROPOSED AMENDMENT OF BY-LAWS

MR. STEPHENSON: Mr. Chairman, before we proceed to the election of officers, there is one remark to be made in regard to our by-laws. I would like to move the following change in the by-laws that paragraphs 3 and 5 of Article III of the By-Laws of the Technical Section, which paragraphs relate to the membership, be amended by deleting the words "not engaged in selling materials or supplies." There are two main reasons for making that motion. One is that progress is going to depend pretty largely upon close cooperaration among the members of the Technical Section and the engineers making machinery and developing processes. We also depend pretty largely upon men in this line of work for papers at our meetings, and there is a tendency growing amongst our technical men and engineers who develop processes and machines to patent them and to have that equipment made and sold to the mill. So, while we may not be exoctly two-faced, we seem to be tending in that way. I therefore would make that motion. I think it requires a unanimous vote to pass without having previously been submitted to the Section for consideration.

DR. BATES: As former Chairman of the Technical Section at the time that this phrase was incorporated in the constitution and after changing my mind on this particular question I take pleasure in seconding the motion . I agree with Mr. Stephenson that the motion should have been submitted, I think, a month before the meeting and that it now requires a unanimous vote unless it is the wish of the meeting to postpone it till the next meeting of the section.

MR. CARRUTHERS: You have heard the motion. Before asking for a vote, I would be glad to have any suggestions from any of those who are present.

MR. SHIPMAN: Until now I have been amongst those who have thought that that part of the by-laws should be maintained. I know there are a great many in the Technical Section who think one way while there are many others who have a different opinion. I notice that Dr. Bates has now changed his mind from what it was a few years ago. I did not know that this proposition was coming up and I have not given it any thought at all. I would not like to be forced to vote either for or against it without giving it better consideration and discussing it with several members of the Executive. I am perfectly willing to be shown the arguments for this revision but, without giving it more consideration, I am still of the opinion that I have held in the past.

MR. CARRUTHERS: Under the circumstances, Gentlemen, I think it would be in order to move an amendment. There is no special reason why this should go through to-day, and if some one would be good enough to move an amendment, we will have the matter brought up in a less hasty way.

MR. SHIPMAN: I move as an amendment to Mr. Stephenson's motion that this proposal may be given proper time for discussion and that the motion be laid on the table until the next meeting.

MR. WARDLE: I will second the amendment.

Amendment (Mr. Shipman) agreed to.

REPORT OF SPECIAL COMMITTEE ON PROPOSED EDUCATIONAL COURSE.

MR. CROSSLEY: Mr. Chairman, I have been asked to report for the Special Committee that was appointed to consider the proposal of the Industrial and Educational Publishing Company. I have the report which is as follows:

"This Committee has considered the proposal of the Industrial and Educational Publishing Company to take over the development of education in the industry as per their letter attached to the report. It was decided that the Technical Section recommend the acceptance of this proposal in principle by the Canadian Pulp and Paper Association and that an advisory committee of Executives in the industry be appointed by the Association to arrange details and supervise the development of the plan and its operation. It is also recommended that authority be given the Education Committee to arrange for the translation into French of the elementary sections of the text books.

For the Committe: George Carruthers, R. W. Hovey, J. O. Mason, J. N. Stephenson, William Anderson, W. G. Mitchell, W. B. Campbell, T. L. Crossley.

MR. CARRUTHERS: Gentlemen, you have heard the report of the Special Committee dealing with this question of instructional work in connection with our text books. The Committee have given this matter careful consideration and personally I believe the recommendation is a wise one.

MR. CROSSLEY: I move that the report of the Special Committee on Education be accepted and that it be recommended to the favourable consideration of the parent body.

MR. H. N. LEE: I second the motion.

Motion (Mr. Crossley) agreed to.

Note.—At the meeting of the Canadian Pulp and Paper Association the recommendation of this committee was approved and the Executive appointed a committee to oversee the work.

ELECTION OF OFFICERS FOR 1922

DR. BATES: On behalf of the Nominating Committee appointed yesterday consisting of Mr. Stephenson, Mr. Crossley and myself, I beg to make the nominations for officers for the coming year. I would ask you to excuse the Committee for this last minute business of which Mr. Wardle has complained. I regret that the Section has slipped away from the systematic method pursued a few years ago. However, we have had the advantage of having been together during the last two days and we have discussed this matter, whereas, if the Nomination Committee had been appointed two or three months ago it might have been harder to find an opportunity to give full consideration to it. I will take these nominations one by one and let you act accordingly. The only nomination we have for Chairman for the coming year, is that of Mr. O. F. Bryant. The Nominating Committee, while bringing in that nomination, are quite in sympathy with the idea of individual members making other nominations if they so desire.

MR. CARRUTHERS: I can hardly think, in view of the undoubted qualifications of Mr. Bryant for this office that any one would have any further nominations to offer. However, if there are any, we will be pleased to have them.

Mr. Bryant was declared elected Chairman of the Technical Section for the ensuing year.

MR. CARRUTHERS: Gentlemen, I have great pleasure in introducing Mr. Bryant to you, I commend him to your favorable consideration in every way and I trust that he will have the same hearty cooperation and support as has been accorded to me during the past year.

Mr. Bryant took the Chair.

The other officers were nominated and declared elected as follows:

Vice-Chairman, Mr. R. W. Hovey; Councillors, Mr. George Carruthers, Mr. Charles Nelson Gain, Mr. Maurice Neilson.

VOTE OF THANKS TO RETIRING OFFICERS

MR. STEPHENSON: I did not think of this matter before, and I did not come primed for it farther than to state the fact that for the past year I have been more or less associated with the officers who have served our Section. In view of the amount of work I know they have done, the conscientious and self sacrificing way in which they have attended to their duties, which have sometimes been pretty heavy, and the personal inconvenience some of them have suffered attending the meetings and carrying on the work, I want to move a hearty vote of thanks to the retiring officers and especially to mention the great amount of work that has been done, and the thought and heart that have been put into it, by our retiring Chairman.

MR. MASON: I have great pleasure in seconding that motion.

Motion (Mr. Stephenson) carried.

MR. BRYANT: I think this concludes our program. It was, I think, Mr. Shipman who set the example of not making an inaugural speech and I shall certainly follow it. The motion to adjourn is in order.

MR. HOVEY: Down in the corner there are a few charts and I would like to have members look them over and make any comments they care to. I move the adjournment of this meeting.

MR. WARDLE: I second the motion.

Motion (Mr. Hovey) agreed to.

THE BEST INVESTMENT IN THE WORLD

(From the Broke Hustler)

When the evening paper comes in you will notice a great many men take a glance over the headings on the front page, then turn to the financial page and spend a good deal of time studying the stock market. They are looking to see how their investments are coming on, or they are studying the prices to see what would make a good investment.

The way to make money is to invest money. Finance is simply investment. Yet a lot of the men who study the financial pages looking for a good investment, miss the best investment there is in the world. They don't see it on the financial page. There are a lot who do see the investment, and who actually invest. These men you can pick out in any town or any city. They are the men with the big jobs. These not only invested, but they have collected dividends on their investment. These men with the big jobs have invested everything they had in thought, in energy, in time, in the work before them. In this investment you can't lose. A man who invests every cent he has on the turn of the stock market may become a pauper overnight. But the man who gives all he has to his work, not only can't lose but he can't help reaping rich dividends.

It is the only investment known which pays big dividends without the slightest chance of loss. Even if it is some time before your employer's eyes are opened to the fact that you are doing good work and recognize it in a financial way, you are getting dividends right along. The very fact that you are putting thought and energy into your work makes you a better man, and increases your earning power permanently. It fits you for a bigger job and a better job. It increases your own self respect. You can carry your head high, knowing that you are giving your best and you gradually acquire the serenity of mind and the sound satisfaction that comes from duty well done.

Invest in the stock market, if you know how to pick the good ones, but on no account overlook the biggest chance for investment in the world.

Steam pipes make an awful racket when they are full of hot air; so do people.

British Technical Section

ANNUAL MEETING

The Technical Section of the British Papermakers' Association of Great Britain and Ireland has become a most important adjunct to the paper industry and it was not surprising that the annual meeting—held prior to the annual meeting of the Association—was largely attended. Mr. Arthur Baker, President, was in the chair. He has done considerable spade work for the Section and his tenure of office expired at the meeting.

Annual Report

Reporting on the Technical Section to the Association proper, Mr. A. W. Foster B. A., Secretary, stated: "Up to the year 1920, the Association had always adhered rigorously to the principle that its privileges were only open to the actual proprietors of paper mills, and that no activities should be undertaken which involved any extension of this idea. In March of that year, however, plans for the formation of a Technical Section were formulated which enable the Association to bring together for the first time the papermakers, chemists, engineers, and accountants on whose technical skill was based the whole fabric of the paper industry. It was speedily discovered that the advantages to be gained by interchange of views and opinions, and by the pooling of information in the common stock, were as great among the technical experts as among those in supreme control of the trade. The future of British papermaking, it is recognised, depends more on the quality of its production than on the price at which that product can be sold, important as the latter factor may be; and the quality of the product depends directly on the efficiency of the industry's technical experts. Once this fact was clearly envisaged, it became evident that an organisation which would bring together the technical experts and encourage them to compare notes was an essential element in the reconstruction of the trade, and from this followed, naturally, the foundation of the Technical Section."

The Section Justifies Itself

"The Section has justified the hopes which surrounded its early days," adds Mr. Foster. "Its general conferences have attained a high standard of excellence, and the four volumes in which its proceedings have been published are a contribution of permanent value to the literature of the industry. Its work in other directions has also been successful, a notable achievement being the restoration of the First Grade Examination in Papermaking Technology to the program of the City and Guilds of London Institute and the revision on scientific lines of the syllabus for both the First and Final Grades. The time has come in the opinion of the Committee of the Technical Section, to put the Section upon a basis which will enable it to continue and increase the services which it is rendering to papermaking, and this opinion has been confirmed by the Association's Finance Committee, which has approved of the application for financial aid which has been presented by that Committee. The new arrangement, when finally authorised by the Executive Council, will enable the Technical Section to expand its activities in the following respects:—

New Ideas—Canada's Co-operation

(1) Every member of the Association will, **ipso facto**, become a member of the Technical Section, and will receive the periodical proceedings of the Section free of cost, as well as being entitled to send representatives to the Conferences, both general and local. The response to the invitation for papermaking firms to become direct members of the Section has been so small that the Committee have decided to adopt this course, feeling certain that it is only necessary for firms to see the Section's publications for them to realise its value. (2) All current technical journals, both English and Foreign, will be available for members at the Association offices, and abstracts of important contributions will be circulated from time to time. In the work of preparing these abstracts the Technical Section purpose to co-operate with the Technical Sections of Canada and the United States, so that there will be no overlapping, but the whole program will be carried through with the maximum of economy. (3) A reference library will be built up in course of time, which will be at the service of members and their technical staffs. The library which, by the generous act of Mr. Lewis Evans, F. S. A., became the property of the Association at the end of his term of presidency, is, of course, a magnificient nucleus for such a scheme, but its very value renders it inapplicable for the purposes of a loan library, as the majority of its contents are of such a unique character as forbids their being removed from the Association Offices. A reference library of specialists' textbook, technical journals and published research work, which is the aim of the present movement, can be accumulated in a year or two, and continously added to at comparatively small expense."

Research Work

"Research Work", goes on the report "into the foundamental problems of the industry will be undertaken on such lines as may appear most immediately useful and most likely to arrive in the long run, at results of permanent value. The Technical Section, during its two years of existence, has brought together for the first time the technical experts of the industry, and it is only necessary to utilise on proper lines the forces which have now been organised, to achive results of greater importance. It may, perhaps, be of interest if members are informed that the whole of the work done for the Technical Section up to the present time has been honorary in its character, no payments having been made to any member, or staff of the Association, who have assisted in the production of its proceedings."

With reference to the latter part of the report, the Association has now made a fair grant to the Technical Section to help the work.

Election of Officers

After the report had been submitted to the Section, the members proceeded to elect new officials. Capt. W. E. Nuttall, who is well-known for his interest in the Section was elected President of the Section. He belongs to the firm of Cooke and Nuttall, Ltd. Mr. F. Heckford (of the Chemists Department of John Dicknison and Co. Ltd., and a well-known lecturer) was elected vice-chairman, in room of Major Edington Aitken, who has done so much in advancing the work of the Section by papers and help. Hearty votes of thanks were accorded Mr. Baker (the retiring President) and Major Aitken, for their valuable service.

Unless we learn to control our tempers we shall be at the mercy of these tempers all through our lives.

Canada Paper Co., One of Canada's Oldest Mills

The extensive institution around which has grown up the town of Windsor Mills, fifteen miles from Sherbrooke, on the Grand Trunk Railway, was originally a Sherbrooke industry, and some of Sherbrooke's citizens have still a kindly remembrance of Mr. Thomas Logan, who had charge of the first works in this city.

This firm has been continuously in business for over sixty years, the business being founded by Messrs. Angus, Logan & Company in Montreal in 1859. Shortly after this the Company had in operation a small paper mill not far from the site of the new street railway power house, on the Magog River, in Sherbrooke. Not being satisfied with a leased power, the Company established a mill at the village of Windsor Mills about 1862, and in 1864 established the first pulp mill in Canada, the second pulp mill to be operated in North America.

Mr. William Angus, of Montreal, furnishes the following historic note relative to the beginning of this great industry:

"Mr. William Brooke first rented the paper mill from the British American Land Company, William Angus & Co. sold the paper for Mr. Brooke in 1859-60 and took over the lease of the mill from the B. A. L. Co. The mill was burned about 1861. William Angus & Co. ran the new brick mill for the B. A. Land Company for two or three years, then started a new mill which they built at Windsor Mills in 1864 under the name of Angus, Logan & Co. sold out to the Canada Paper Company later. It was at the mill at Windsor that the first chemical pulp, and paper from it, was made in Canada.

Development of the Business.

After this the business of the firm grew rapidly, and in 1873 the old firm was formed into a limited company, with Mr. William Angus as President, and Mr. Thomas Logan as Works Manager. Shortly afterwards the Company built a second mill, the Springvale Mill, a short distance up the Ouattapekah River. This mill turned out about twelve tons per day, which was considered very fine at that time.

The selling of the product at that time was done through the wholesale stationery house of Messrs. Angus, Logan & Company, in Montreal, but in 1879 a branch was established in Toronto, under the charge of Mr. John Macfarlane, who afterwards became President of the Company. In 1898 a ground wood pulp mill was established on wood pulp mill was established on the St. Francis River on the site of what is known as the St. Francis Mill, and paper machinery was afterwards added. In 1901 this pulp and paper mill were entirely destroyed by fire, and as this was the best asset of the Company, the fire proved a very serious blow. The loss was met by an issue of preferred stock; some changes on the directorate were made, Sir H. Montagu Allan was elected President, and Mr. F. J. Campbell, then manager of the Toronto branch, was appointed General Manager. The Head Office of the Company was moved to Windsor Mills and work was vigorously begun on what is now the Company's St. Francis Mill. This mill began operation in 1902, and now has a daily capacity of sixty tons of pulp and fifty-five tons of paper.

The New Windsor Mill.

In 1908 Mr. Joseph Kilgour, of Toronto, became associated with the Company and shortly afterwards was elected President. The Company then undertook the reconstruction of its old mills. Springvale Mill, which stood some distance up the Ouattapekah River, was dismantled, and Windsor Mill, which stands not far from the railway station, was entirely rebuilt, with a capacity equal to the product of the two old ones. Windsor Mill is now one of the most efficient in the country, and is designed for the economic production of colors and fine wood pulp papers. It has a capacity of 70 tons per day of fine papers and 60 tons per day of pulp. The Company owns its lands in fee simple and has large and unbroken limits situated on the Ouattapekah and Stoke Rivers beside Government limits on the St. Anne River.

Distribution of the Output.

The Company has warehouses in Montreal and Toronto and agencies in foreign countries. The fine papers produced in Windsor Mills are sold almost altogether in Canada, the selling being looked after by a large staff of well trained salesmen. Practically every printer uses large quantities of the special lines made at Windsor Mills. The Company ships newsprint all over the world.

MR. F. J. CAMPBELL
General Manager, Canada Paper Co.

The Canada Paper Company is rightly recorded as essentially a Townships institution, and is doubtless one of the most beneficial of them. Besides paying large sums annually in wages, the Company distributes large amonts among industrial and mercantile firms of the district through the purchase of machinery and supplies, in addition to which the Company spends many thousands per annum in the purchase and preparation of pulp-wood. In return, most of the merchants purchase more or less of the Company's product, in one form or another.

The Sherbrooke Daily Record has purchased its supply of newsprint from the Canada Paper Company for over twenty years. This now exceeds two hundred tons, or twelve car loads annually.

Some of the Company's Special Products.

Besides manufacturing a line of special papers, the Canada Paper Company has been very successful in the production of specialties, one of which is their Art Photo Book, a printing paper largely in use for catalogues and other publications. It is particularly adapted for securing good effects with half tone cuts and is largely used on this account. The Company makes a specialty of colored papers and are in a position to undertake the manufacture of colored papers of every description.

Besides this, they manufacture high grade wrappings, of which their Invictus Fibre, a tough and practically waterproof paper, and Scotch Fibre are the chief lines. These are largely used by those desiring ample protection for their goods, together with a handsome looking parcel.

This great industry which means so much to the wealth of Quebec Province is well represented by the mills of the Canada Paper Company, one of the pioneers in paper making, and which have so long and successfully operated in this district and around which has grown up the prosperous town of Windsor Mills.

AEROPLANES, BUD WORMS AND PRICES

The need for accurate knowledge of what the forests contain, the rates of growth, and other similar conditions in the pulp wood producing forests was featured at the convention of the Woodlands Section. After some of those in attendence had told of methods of working out the information through detailed cruises, Ellwood Wilson of the Laurentide Company said he could get the information in one tenth of the time through the use of aeroplane photographs. He said that the aeroplane would do remarkably effective work in cruising timber, and explained methods of working out photographic surveys.

The devastation by the psruce bud worm was another important subject of discussion. The steps necessary to stop the inroads of this pest were discussed by foresters and insect specialists, but the pseakers agreed in admitting that the worm was causing damage of millions of dollars every year, and that the progress of the infection of new timber limits had not yet been stooped.

The cost of commercial reforestation by paper companies was discussed by several speakers, and it was again brought out that the paper industry is leading the actual commercial planting of trees, both in the United States and Canada.

Reports by Secretary O. M. Porter of the Section as a result of the seasonal comilation of pulp wood statistics, showed that the pulp wood cut of last winter was only about 28 per cent. of the normal. These figures also indicated a tendency to higher prices for the wood which the paper companies purchased during the last winter.

ABITIBI POWER & PAPER RAILWAY

Abitibi Power and Paper Company is building its own railway for the transportation of raw material from Iroquois Falls to a point about twelve miles north. This will link the Iroquois Falls branch of the T. and N. O. Railway up with the village of Hughes on the main line of the National Transcontinental. The railway will pass through the townships of Edward, Mortimer and part of Stimson.

BUD-WORM KILLED CUT OF 16 YEARS

St. John, April 11.—The reconnaissance survey of the forests of New Brunswick, made under the direction of John Tothill, of the Dominion Entomological Branch, for the purpose of determining the extent of the ravages of the spruce bud-worm, shows that this pest has about run its course. No new outbreaks have been discovered for some time, though some slight infestations were reported last summer in Gloucester County, near the Quebec border. A gratifying feature of the situation is that the spruce which was attacked is making a rapid recovery, and will show little effects of the attack in a few years' time beyond the slight suppression in growth. The percentage of attacked balsam fir which is recovering is, however, very small.

The bud-worm plague has proved the greatest calamity to befall the forests of the Province since the larsh saw-fly plague which broke out in the early eighties of the last century and killed practically all the tamarac. It is estimated that the bud-worm pest destroyed four million feet of balsam fir and practically destroyed 360 million feet of spruce on the Crown Lands of the Province. The damage done to private timber lands was also serious. The amount of timber destroyed is equal to the amount cut on the Crown Lands for the period of sixteen years, and according to the estimates of Hon. C. W. Robinson, Minister of Lands and Mines, represents a stumpage value of about $19,000,000 which should have flowed into the Provincial treasury during the next fifty years.

Now Dead Wilderness

Many of the forest areas in which balsam predominated are now a vast wilderness of dead trees, mostly fallen and partially decayed. Much of the dead timber was salvaged, but the larger percentage could not be removed for various reason and so became a dead loss. The accumulation of so much dead material has left the forests in a rather serious state, providing a stamping ground for the development of bark beetles and wood-boring insects, as well as forming a dangerous fire hazard, and a menace to the forest in general.

Considered collectively, however, the loss due to the bud-worm, while serious, is by no means disastrous. The stands of spruce, the backbone of the lumber industry, aggregate nearly twice the quantity of fir, and valuable stands of cedar, hemlock, pine, maple, birch, beech, and poplar have been untouched by the plague.

The annual revenue which the Provincial Government derives from the Crown Lands, or the extent of lumbering operations in the future will not necessarily show a reduction proportionate to the damage done by the bud-worm. A heavier drain may have to be made on the stands of spruce and pine, but the stability of the lumber and pulp-wood industries will not be seriously affected. In spite of the enormous ravage of fir, the balsam fir stands, left untouched by the plague, are still large, and a great deal of the dead timber will be salvaged, as the Government has reduced the stumpage rate on it to half that of green timber, to encourage cutting.

Brighter Outlook

The survey made under Mr. Tothill's direction showed that in the matter of reproduction the forests had suffered very little and this fact, coupled with the rapid recovery of the spruce, give a much brighter outlook than could have been forecasted a year or two ago.

New Brunswick is essentially a forest province. The traveller, passing over railways or trunk roads, probably does not realize that over seventy per cent. of the total area of the Province is forest land, because the railways traverse the agricultural sections and the trunk road follow largely the river valleys and settled areas. The Crown Forest lands cover over seven and a half million acres, or over half the total forest lands of the Province, the greater portion being located in the northern and central counties. The Provincial Government has in theseCrown lands an asset valued at well over $100,000,000. About half the Provincial revenue is now derived from these lands, principally from the stumpage dues, which operators holding leases of the public lands pay on their cut, the basic rate at present being about $5.00 per thousand feet.

The fact that the New Brunswick Government is a great owner of forest lands is mainly due to the circumstance that many years ago the Imperial Government, instead of granting all the lands worth anything to private individuals, as in Nova Scotia, reserved great areas as Crown property with the idea of having a ready supply of spars and other timber for the Royal Navy.

ABITIBI RIVER POWER DEVELOPMENT

Cochrane, Ont., April 21.—**(To Montreal Star)**—The power situation with respect to the distribution of the right to develop electric energy on the Abitibi river for industrial use in the Porcupine gold area, the Abitibi Power and Paper Company's operations, and the T. and N. O. Railway, has been practically settled.

The Hollinger Consolidated will, in all probability, be given the right to proceed with hydro-electric development at a point below the Long Sault Rapids, where it is estimated a total of approximately forty thousand horsepower may be developed. The one remaining point to be decided has to do with regulations in connection with the control of the storage at the head of the river. This is now controlled by the Abitibi Power and Paper Company, and has been brought about at considerable expense, which fact has led the Abitibi interests to hold out a demand for compensation. At the same time, these who are to develop below the Long Sault are negotiating for a voice as to the manner in which the storage will be controlled. This request has been occasioned by the fact that it is the present policy of the Abitibi to conserve the flow of water on Sundays, a policy that would not fit in with the generation of power at points lower down, where a steady current would be required every day of the week, for the purpose of keeping mining operations going at normal rate. Satisfactory precaution and reservations have been made for the hydro-electrication of the T. and N. O. Railway at an early and future date, and indications appear to be that any further delay in the commencement of actual construction will be short.

It is understood that Premier Drury has suggested that a committee of engineers should get together and bring in a report.

These engineers are to be representative of the Hollinger Consolidated, the Abitibi Power and Paper Company, and the T. and N. O. Railway, and there is every reasonable assurance that the findings of the commission will be such as to bring about a condition under which the Hollinger may proceed with whatever development plans the company has in mind.

CLARKE BROS. LTD. TO RAISE $600,000

Toronto, April 25. Bondholders of Clarke Bros., Ltd., who met in Toronto today in response to an appeal for a special meeting from the bondholders' committee, approved and ratified a proposal to sell $600,000 prior lien sinking fund bonds already referred to in these columns. The proceeds of the issue will be used to supply working capital, to liquidate present liabilities and to provide for the additional water supply facilities required for the enlarged mill. The meeting, which was attended by approximately 90 per cent. of the bondholders, was practically unanimous in their approval of the issue, and it is expected that the bonds would be offered for public subscription very shortly. The bonds bear interest at 7 per cent., and are for a period of fifteen years, and provision is made for the establishment of a sinking fund after the first five years with the addition of $50,000 yearly. The bonds are retirable at 105 on any interest date after five years, and the whole on any interest date at 103, interest and principal payable in New York funds.

The company has been handicaped in its operations from the lack of adequate capital, financing arrangements completed last fall not proving successful in view of the stringency of the money market, at the time. Operations have been conducted since at well under capacity on this account. In order to facilitate the sale of the present issue and to ease the company's financial position, the bondholders were asked to subscribe to certain other conditions as follows:

1—That holders of outstanding first mortgage serial bonds postpone maturity of their bonds for five years.

2—That holders of refunding bonds postpone commencement of the sinking fund required by the trust deed securing that issue for five years.

The bondholders at today's meeting endorsed these proposals, and cleared the way for the new financing.

NEWSPRINT DEVELOPMENTS

Seven new machines with a total rated capacity of 558 tons of newsprint daily were brought into operation in Canada during 1921, bringing the maximum daily production of newsprint up to 3,342 tons, or 1,002,600 tons a year, according to a statement in the Pacific Coast Lumberman. Two additional mills are now in the course of construction, and are expected to be in operation shortly. These will bring Canada's maximum newsprint productive capacity up to 1,032,600 tons annually, an amount approximately 50 per cent of the total newsprint consumption of the American continent.

WESTERN CANADA PULP FORECLOSURE

Toronto, April 24.—Debenture holders of the Western Canada Pulp & Paper Co. met in the offices of the Chartered Trust & Executor Co. today to consider action to protect their interests if such was deemed advisable. The company defaulted in the payment of interest on its bonds on February 1 last and the bondholders have taken foreclosure proceedings and are now offering the company's properties for sale. The debenture holders, who have second claim upon the assets of the company, decided to allow the sale to proceed.

They will share in the proceeds, if any, after the claims of the bondholders are satisfied.

It is not enough for one to be a Christian. He may be sincere in his piety and able to pray and talk on religion, and yet be so disagreeable that every one will avoid his company.

Technical Section

REVIEW OF RECENT LITERATURE

B-1 Growth and Wind. BERNBECK. **Forstwiss. Centralbl.**, xlii, 27-40, 59-69, 93-100, (1920); **Botanical Abs.**, vii, 14, (Feb. 1921). The author discusses the adaptation of vegetation to wind and the effects of wind on vegetation, with especial reference to forest growth. Adaptation is to enable the plant to withstand the physical impact of wind, or to prevent excessive evaporation from the plant tissues, or both. Wind firmness is not an inherent characteristic of any given species, although the tendency to wind-firmness may be inherited; thus a fir grown in the open may be much more windfirm than an oak grown in a dense stand and protected from wind. Under the right conditions any tree can develop a wind-firm form. This fact can be utilized in silvicultural management, so as to minimize loss from windfall. (35,000,000 cubic meters of timber, principally coniferous, was blown down in Germany during the last century). Wind climate often governs the geographical distribution of trees. For instance, conifers are most liable to injury during the winter months; so sites exposed to continuous winter winds (if fertile enough to allow tall tree growth) are usually occupied by hardwoods, while mountain slopes and plateaus where heavy early summer winds prevail are occupied by conifers. Wind affects the form and growth of trees not only indirectly, by its influence on such site-factors as soil moisture, transpiration, temperature, and exposure of foliage to the light, but also directly by its effect on the plant tissues. Internal stresses and friction between the fibers result in eccentric growth, and also help to stunt the tree by interrupting cap-flow and by affecting cell-structure and turgescence. Investigations made at Bonn showed clearly that the stunting effect of wind increases rapidly with wind velocity. A. P. -C.

B-1 The Supply and Maintenance of Water in Plants during Wind. BERNBECK. **Naturwiss. Zeitschr. Forst --. Landw** xviii, 121-141, (1920); **Botanical Abs.**, vii, 14, (Feb. 1921). The physiological action of the mechanical strength of winds in relation to transpiration is manifested in an increase in the amount of moisture given off. The rate of this increase is, in general, governed by the conditions of firmness or stability and inflexibility as opposed to the attacking force of the wind. The following are three in which the mechanical action of the wind leads to increase in water loss: (1) The intercellular gas renews itself in spite of reactions of the stomata, whereby an increase in intercellular transpiration is involved. (2) An excess of pressure in water conducting tissues is occasioned by torsion, pressure, etc. (3) The water permeability of the outer epidermal wall and the periderm is decreased by deformations. - A. P. -C.

B-2 Forestry in France. Australian Forest. J., iii, 141-142, (1920); **Botanical Abs.**, vii, 12, (Feb. 1921). A description is given of the French method of silvicultural management of a practically normal beech forest of 26,000 acres having a negligible admixture of oak in the State forest in the neighbourhood of Lyons-la-Forêt in the Department of Eure The present method of regulation is based on the uniform compartment system with natural regeneration. A.P.-C.

B-9 Progress of Forestry under Independent Management in New South Wales. R. DALRYMPLE HALE. **Abs.**, vii, 17, (Feb. 1921). A record of established **Australian Forest. J.**, iii, 151-156, (1920); **Botanical** progress in forest management by the Forestry Commission of New South Wales following a needed reform is given under these topics: classification, demarkation and organization, fire protection, utilization and regeneration of hardwood forests, publicity work, forest grasing, forestry statistics, forestry education, coniferous plantations, research, and forest revenue. A. P. -C.

B-0. Forestry and the Forest Outlook in the U. S. A. HELGE SYLVEN. **Skogen**, vi, 257-271, (1919); **Botanical Abs.**, viii, 27, (May 1921). The article gives a survey of the country's original and present timber resources; it rehearses the well known story of forest devastation which has led to the present agitation for a national forest policy. The provisions of the policy proposed by the U. S. Forest Service are outlined. Considerable space is given to the organization of the Forest Service. The author welcomes the entrance of the U. S. into the field of forestry as an important step toward the welfare not only of the country itself but of the entire world. Expression is given to the idea that the forest question before the industrial world is no longer one of commercial competition but how best to meet the problems of production, distribution and utilization with a view towards supplying the needs of all countries. It is prophesied that the U. S. will rapidly take a place with European nations in the practice of forestry once the control of forest affairs is placed in the hands of the American foresters to whose ability and enthusiasm he pays a high tribute. A.P. -C.

B-0. Professional Forestry Education. C. E. LANE-POOLE. **Australian Forestry J.**,iii, 217-223, (1920); **Botanical Abs.**, viii, 10-11, (May 1921). A paper read at the Hobart Forestry Conference. The author advances arguments for the establishment of a federal forestry school organized along the lines of the French school at Nancy, considered as the best of its kind in Europe. The curriculum, faculty, terms, fees, and certain other details of organization are discussed. New South Wales, on account of the great diversity of its forest conditions, is suggested as the most desirable state in Australia for the school. -A. P.-C.

K-12; K-14. Notes on Two Causes of Waste on Paper Machines. E. MARGUET. **Papeterie**, xliii, 530-533, (June 25, 1921). Paper is usually fed to revolving or fly knives by means of two cast iron cylinders, which are as wide as the sheet but which bear on each other only by means of a slight swelling about 20-25 inches long in the middle of the upper roll. The eight or ten sheets which are usually fed simultaneously are thus subjected to a very heavy pressure at this point, and if they do not arrive at the rolls perfectly smooth and flat there is very chance that there will be numerous creases. This is especially noticeable when the rolls have not been properly wound and results in a large amount of waste. In one case the formation of a large amount of creases was traced to the following cause; in the manufacture of parchment paper the stock could not be beaten as much as would have been desirable, and the incompleteness of the beating was compensated by moisting the sheet considerably and strongly heating some of the calender rolls. The bronze plate which lay under the wire under the slices had been grooved due to uneven wear by the wire, and with the relatively free stock that was being used this caused uneven draining and resulted in the formation of numerous creases. After planing the bronze plate the formation of creases ceased. -A.P.-C.

K-23. Qualities of Raw Photographic Stock. Papeterie, xliii, 533-534, (June 25, 1921). The qualities required of raw photographic stock depend on the photographic process for which it is required, and these may be classeed as follows: (1) paper destined to receive the image directly (platinum papers, blue-print papers); (2) papers which are to serve as a base for an intermediate coating of baryta which receives the image (celloidine papers, bromide papers, etc.); (3) papers which receive temporarily the sensitized coating (pigment papers, etc.). It is evident that class (1) papers require exceptionally pure stock, and more particularly they must be as free as possible from metallic impurities. All papers intended to receive a photographic image directly and permanently should be made entirely from high-grade rag stock. Certain heliograph papers (for copying), which receive the sensitized coating only temporarily, can be made partly from chemical pulp. Paper coated with baryta can contain up to 40 per cent. of very pure chemical wood pulp. Decomposed animal size discollors the images (reddish with silver images and blue-black with platinum images). As a rule raw photographic stock is given three coatings of barium sulphate and gelatine and is then coated with the sensitized emulsion. -A. P.-C.

K-12. Ryberg Machine Wire. Papir-Journalen, No. 22 (Dec. 11, 1920). The wire is a device for increasing production by reducing friction and choking, whereby the cost of cleaning with steam is eleminated, as well as marking of sheet. The wire operates as a drive for the rolls.—P.B.

K-12. Regulation of Machine Wires. Papir-Journalen, No. 7. (May 14, 1921). The wire is operated automatically by means of a sliding plate in connection with a spindle and a bent arm, whereby the rolls are regulated and held in a single position.—P.B.

K-12. The Use of Machine Wires in Board Mills. Pappen u. Holzstoff-Ztg., No. 23, (June 9, 1921). The author gives a detailed description of the strain and wear to which wires are subject, and of the measures essential for their efficient working.—P.B.

K-12. Dryer for Paper. CURT BAUER, Ger. patent No. 339,721, Class 55d, Group 19, **Papier-Fabr.,** xix 880, (Aug. 19, 1921). The paper travels over rolls in a totally enclosed housing. Warm air blows through the channels which are arranged in zig-zag manner. Outlets are provided for the cool air.—E.H.W.

K-16. Manufacture of Wrapping Papers. Pappen u. Holzstoff-Ztg., No. 21 and 23, (May 26 and June 8, 1921.) A cheap and serviceable product is best made out of old papers, carefully sorted and cleaned. The process consists in preliminary treatment in the hollander followed by prolonged heating.—P.B.

K-18. Water Consumption in Board Mills. Pappen u. Holzstoff Ztg., Nos. 16 and 20, (1921). Fresh water is employed only for spraying the cylinder and felt. Estimates of the quantity of water used in the kollergang and hollander are given, with lengthy practical details of manufacture.—P.B.

K-23. Safety Paper. POENSGEN and HEVER, Ger. patent No. 338,333, Class 55f, **Papier Ztg.,** xlvi, 2763, (Aug. 4, 1921.) The fundamental idea is based on photographic principles and depends on the fact that the papers are sensitive to acids and erasures and that the reproduction of color is difficult.—H.E.W.

L-8. Press Room Requirements. S. M. WILLIAMS, New York **World. Paper,** xxviii, 14-16, (July 20, 1921). A discussion from a printer's point of view of the principal causes of damage to newsprint, which are: (1) bad splices, (2) poor winding, (3) improper wrapping, (4) careless loading, (5) rough handling and trucking, (6) press room operations. -A.P.-C.

P-4 Human Waste in Industry. HARRY E. MOCK, M. D., Fellow American College of Surgeons. **Chem. Met. Eng.,** xxv, 369-74, (Aug. 31, 1921). Strong emphasis is placed on the role of the physician in industrial plants, and an outline is given of the preventive and curative medical serices which can be rendered to the working forces in industry. -A. P. -C.

R-6 Waste due to Poor Engineering and Management. DEXTER S. KIMBALL, Dean of College of Engineering, Cornell University, Ithaca, N. Y. **Chem. Met. Eng.,** xxv, 375-377, (Aug. 31, 1921). Sound engineering practice and competent management are the most effective methods of eliminating waste. Accurate cost records of what has been done should make possible the prediction of improved results. -A. P.-C.

R-6 The Role of Research in the Elimination of Waste. HARRISON E. HOWE, National Research Council, Washington, D. C. **Chem. Met. Eng.,** xxv, 379-382, (Aug. 31, 1921). Encouragement of fundamental research in America is more urgently needed than stimulation of industrial research. The fallacy of curtailing research and disrupting organizations in times of industrial depressions is shown. Well chosen examples are given of how waste was eliminated by research. -A. P. -C.

R-6 Waste to Lack of Standardization of Chemicals. WALLACE P. COHOE, New York City. **Chem. Met. Eng.,** xxv, 383-384, (Aug. 31, 1921). Careful standardization of chemical products will result in eliminating misunderstandings between buyer and seller, will reduce the diversity of products to the ultimate advantage of the consumer and will facilitate national and international trade in chemicals. -A. P. -C.

R-6 Disclosing Waste through Better Cost Methods. ERNEST J. WESSEN, Industrial Engineer, W.T. Rawleigh Co., Freeport, Ill. **Chem. Met. Eng.,** xxv, 389-393, (Aug. 31, 1921). Many industrial failures are traceable to blind dependence on costs determined by rule-of-thumb methods. Modern cost systems will disclose waste in unprofitable products, idle labor and machinery, and erroneous methods. -A. P. -C.

R-6 The Elimination of Construction Wastes. GEORGE W. BURPEE, Vice-Pres., Dwight P. Robinson & Co., Inc., New York. **Chem. Met. Eng.,** xxv, 394-396, (Aug. 31, 1921). A comprehensive dollars and cents analysis of the preventable wastes in the construction industries and a thorough understanding of the responsibility imposed upon the contractor, owner, engineer, architect, and workman. -A. P. -C.

R-6 Some Considerations on Fire Waste. NICHOLAS RICHARDSON, Research Engineer, Watertown Arsenal, Watertown, Mass. **Chem. Met. Eng.,** xxv, 397-400, (Aug. 31, 1921). Industry in general, and the chemical industry in particular, are in need of a fuller appreciation of fire hazards and the appalling waste due to destruction by fire. Various possible fire hazards in industry are reviewed. -A. P. C.

R-6,7 The Personnel Problem: to Eliminate the Waste of Human Effort. L. B. HOPKINS, Treasurer, The Scott Co., Philadelphia. **Chem. Met. Eng.,** xxv, 385-388, (Aug. 31, 1921). Many wastes of time and production can be attributed to improper selection and placement of personnel and to management's failure to recognize the value of training, transfer and promotion of deserving employees. -A. P. -C.

PULP AND PAPER NEWS

Ontario Gazette, April 15th, contains notice that letters patent have been issued to Paper Excelsior Limited, capital $40,000. Provisional Directors are Charles Garfield French, Orval Bayne Thibaudeau and Jean Ferry. The head office is to be in Toronto.

Reports from the camps show that there has been rather too much rain and not enough snow in the latter part of the season, while there was unduly heavy snow in the early period. The result was that cutting was difficult and hauling conditions not too favorable. There was not a heavy cut. Quantities of pulpwood are held over from last season. One lot is on Kapuskasing River and fears are expressed that floods might carry this out to James Bay.

C. V. Syrett of the Victoria Paper and Twine Co. was a visitor in Montreal last week.

F. L. Ratcliff, President of the Ratcliff Paper Co. has returned from a brief trip to Atlantic City.

Mr. J. H. Metcalfe, of the Howard Smith Paper Mills, Limited, has been appointed treasurer of the Purchasing Agents' association of Montreal and district.

Mr. George Carruthers, of the Interlake Tissue Mills, Ltd., Merritton, Ont., was a visitor to Montreal last week.

Mr. Hubert Biermans, of the Belgian Industrial Co., has returned to Shawinigan Falls, after spending several months in Europe.

The pulp and paper mills at Hull have been hampered by the recent high water in the Ottawa River and production has been seriously reduced.

The Scriptures intimate that a man cannot add to his stature by contemplating thereon, but he can add to his efficiency by thinking about it. An instance is furnished by the wood room of the Abitibi Power and Paper Co., where the number of cords of farmers' wood put through the slasher was increased from 200 to 550 cords per day, and the work done by the barkers from 1.19 to 2.5 cords per hour.

The new wrapping paper machine at Iroquois Falls, Ont. has been turned over without clothing and reported satisfactory. It takes some wrapping to cover 500 tons of paper.

CONTINENTAL WOODS PRODUCTS OFFICERS

The annual meeting of the shareholders of the Continental Woods Products Company took place recently at Montreal and the following were elected directors, namely:—Philip T. Dodge (President, International Paper Company, New York.) Herman Elsas (President, Continental Paper and Bag Mills, New York.) Thomas Fynes, Louis Gosselin, K. C., Isidore Kuhe, C. A.L. Hibbard, Chester W. Lyman.

And at the subsequent meeting of the directors the following executive were elected, namely:— Louis Gosselin, K. C., President. Thomas Fynes, Vice-President and Treasurer. E. B. Sagendorf, Secretary.

Mr. E. L. Bliss, who is well known in Ontario and has had considerable experience in the exploitation of the forests and mill operations has been appointed manager of the company's operations in Ontario and, in particular, manager of the company's Ontario plant situate at Elsas. Under his management much is expected from this plant supplied from the Company's extensive timber limits in the Districts of Sudbury.

$5,000.00 PRIZE COMPETITION OPEN TO THE WORLD FOR SUPRESSION OF THE SPRUCE BUD WORM

A prize of Five Thousand Dollars is offered by Mr. Frank J. D. Barnjum of Montreal for a practical method of combatting and suppressing the spruce bud worm, bark beetle and borer which have caused such tremendous damage in the forests of Eastern Canada and the United States. The Province of Quebec alone has suffered a loss during the past ten years of 150,000,000 cords of standing pulpwood by these pests, which represents a market value in pulpwood of three billion dollars, or if manufactured into paper, of seven billion dollars. This represents a loss of wood sufficient for forty-five years requirements for newsprint for the North American continent. This staggering loss has prompted Mr. Barnjum to offer this substantial prize.

Competition will close August 1st, and the $5,000.00 will be paid in cash for the successful suggestion that is accepted by the judges, who will be Sir William Price of Messrs Price Bros., Quebec; Dr. C. D. Howe, Dean of the Faculty of Forestry, Toronto University; Mr. Fred A. Gilbert, Great Northern Paper Company, Bangor, Maine; Mr. G.C. Piche, Chief of Forest Service, Quebec, and Mr. Ellwood Wilson, Laurentide Company, Grand Mere, P. Q.

Competitive suggestions are to be mailed to Mr. Frank J. D. Barnjum, New Birks Building, Montreal, Canada, previous to August 1st.

MAKING PAPER MACHINES AT MONTREAL

The Dominion Engineering Works, Limited, Lachine, P. Q., have secured contracts for two paper machines. One is for the new mill at Port Arthur, Ont., of the Provincial Paper Mills, Limited, and the other for Joseph Ford and Sons Company, Portneuf, P. Q.

The Fourdrinier book machine for the Provincial Paper Mills, Limited, will have a wire 146 ins. wide by 70 ft. long, with Millspaugh suction couch roll, three sets of main presses, and thirty 48 in. paper-dryers. The machine will also have an eight roll stack of calenders, one surface winding drum reel, and a Moore and White 4 drum winder with slitter attachment. The drive for the machine has not yet been decided on, but it will either be a combination of rope and belt or of the electrical sectional type. Delivery of the machine is expected to be made in November.

The machine for Joseph Ford and Sons Company is now under construction. It is a 120 ins. cylinder machine, with one cylinder mould, two sets of presses, 14 main dryers (48 in diameter), a seven roll stack of calenders, with a two drum reel, and Manning type winder.

We are informed by the Dominion Engineering Works, Limited, that the prospects for the paper machine industry are very satisfactory, there being several contracts for new machines which will probably be let during the next few months.

It is good to sojourn in every place as if you meant to spend your life there, never omitting an opportunity of doing a kindness, or speaking a true word, or making a friend.

UNITED STATES NOTES

The American Writing Paper Company reports for the year ended December 31, 1921, gross sales of $13,035,435, against $33,796,758 in 1920, and a deficit, after all expenses and interest of $1,944,775, against a surplus of $1,687,673 in 1920. The total surplus on December 31, last, was $5,866,536, against $8,082,225 on December 31, 1920. President George A. Galliver, in his report to stockholders says: "The year 1921 was notable for drastic liquidations of paper stocks. Retarded by a marked recession in business and export trade, our business was reduced proportionately to the lowest in many years. Orders for the first quarter of this year indicate that the demands of the consumers are again reaching the mills, demonstrating quite satisfactorily that stocks have been fairly well liquidated. Your inventories were priced at cost or market, whichever the lower. A general and gradual improvement in the demand for fine papers is looked for and we face the coming year with confidence that satisfactory results will be secured. "Drastic reductions in the operating costs and operating expenses were instituted, bringing them down to a level consistent with present day conditions". Export trade, said the report, was reduced proportionately to the lowest experienced in many years.

Superintendent Karls of the Lincoln Maine plant of the Eastern Manufacturing Company, is retiring to accept a position as one of the officials of the Champion Coated Paper Company at Hamilton, Ohio. Mr. Karls, in his earlier years in the industry, worked in the Champion mill as a common hand. As a mark of the esteem in which he was held by the employees of the Eastern Manufacturing Company, he was presented with a handsome gold watch by the latter when it became known that he was ending his term as superintendent.

The fiftieth anniversary of Arbor Day last week was marked by countrywide observances and exercises. An unusual feature of the celebration was the broadcasting by radio of a speech sent out by Secretary of Agriculture Wallace. It was declared by experts that this address "reached more people than any human voice since time began." The speech, a plea to make the growing and producing of trees a national concern, was transmitted from the Government stations at Arlington, San Diego, San Francisco, Great Lakes Station and by all the Radio Relay Ieague and other broadcasting stations. The conservation message sounded a warning that unless more thought is given to the need for forests, an increasing social and economic loss will be suffered. The country's forests, which a half century ago were thought to be inexhaustible, have been retreating steadily before fir and axe, said Secretary Wallace, and a vast area of denuded and idle land has resulted. This, he added, can only be restored to usefulness through tree planting. Arbor Day, or "Tree Day," was founded in Nebraska in 1872 by J. Sterling Morton. It is not a national holiday, but has come to be in recent years a more and more observed day of celebration, to encourage the conservation and renaissance of forests in the United States.

A loss put at $30,000 was sustained by the J. & J. Rogers Company when part of a store of 40,000 cords of pulpwood was carried away last week by a flood at Ausable Forks on the Ausable River, New York. Much of the stock that is being salvaged will have to be brought back a distance of eighteen miles by motor truck. All streams throughout the Adirondacks are at flood pitch and many roads have been inundated because of recent heavy rains.

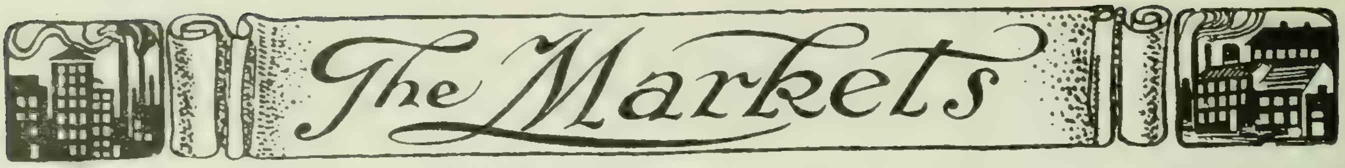
High water in Wisconsin rivers is threatening damage to many of the paper mills in that State. Operations are now being seriously hampered, but it is thought that there will be no further damage to buildings or equipment as the floods are showing signs of reeceeding. Several mills, howevr, have suffred telling damage thus far. The Ladysmith plant ofthe Great Western Paper Company became undermined with water, causing the walls to collapse and the roof to cave in. It will probably be several weeks before this mill can resume operations. Park Falls paper mill plants were caused some damage when raging torrents in the Flambeau river carried away several small dams. Breaks of dams in other localities also caused slight damage to mills, and in nearly all instances forced a suspension or curtailment of operations.

Newspapers and magazines, under a bill passed last week by the House of Representatives, would be permitted to send out single sheets to advertisers of their agents as proof of an advertisement, at the same zone rates of postage applicable to advertising portions of publications entered as second class postal matter. The House Post Office Committee, in reportnig the bill, said it would result in a great saving of paper, inasmuch as advertisers now receive a complete copy of the newspaper or magazine. It was also pointed out that the burden on the mails would be lighter. The measure now goes to the Senate.

Speaking at the joint convention of collegiate foresters and lumber industry representatives at the State College of Forestry, Syracuse University, last Friday, Col. Theo. I. Woolsey, United States representative on the Interallied Timber Commission during the world war, predict that the present alarming problem of forest devastation on private lands will be solved by associations of owners under Federal and State supervision. Col. Woolsey said that if the present devastation of forests and forest lands continues the United States will be forced to seek a large part of its timber supply beyond its borders. He said investigations are now being carried on in the virgin forests of Brazil with a view to finding substitutes for the ever decreasing timber supply in the United States.

New York and other Eastern cities are being considered by the Weis Fiber Container Corporation as possible sites for its new plant. The company's plant at Monroe, Mich., was destroyed recently in a fire entailing a loss approximating one million dollars. The corporation's Eastern representative is hoping to make an early announcement regarding resumption of operations.

The joy that you seemed to surrender is multiplied ten-fold when you begin to seek not yourself but other men.—**Phillips Brooks.**



The Markets

CANADIAN TRADE CONDITIONS

Montreal, April 25. - - Newsprint continues to be the outstanding feature in the pulp and paper markets. It is many moons since the mills were so busy as at present. Not only are all the mills running at capacity, but they have orders which will keep them fully occupied for a considerable period, and which have compelled some of the companies to refuse further business. There are three reasons for the present activity. One is the increased consumption of paper, the other two being concerned with the situation created by the coal strike on the U. S. and the threatened strike of mill hands across the border. The result is that the publishers—some of them short of supplies—are adopting measures to ensure stocks from Canadian manufacturers, and have placed orders here in the hope of protecting themselves against contingencies. This rush to cover requirements has not only brought our mills up to full capacity, but has made it impossible to take care of all the business offering. Even before the coal strike our mills were working very near the point of maximum production. While we are unwittingly profiting from our neighbours' troubles, it is a fortunate circumstance for the publishers that they have in Canadian mills a convenient and reliable source to meet their requirements.

The other sections of the paper industry show little variation. Locally, a moderate business is being transacted. The mills producing fine and book papers report that trade is satisfactory; there is no rush to place orders, but they are coming on steadily, although as a rule of not large amounts. The demand for wrapping is fairly good, but the board section is dull.

In pulp, groundwood is still a very slow market. Sulphite is affected by Scandinavian competition, which is not only severe, but which apparently is at prices which involve substantial losses to the producers. Orders for bleached sulphite have been placed more freely, although prices are not as good as they were.

On the whole the pulp and paper trade is in a condition which is by no means unsatisfactory. The general commercial position which is such an important factor in the pulp and paper industry, is recovering in a very slow way, and until it makes more pronounced headway we cannot expect a large increase in the consumption of paper. Newsprint is in a class by itself, and is governed largely by external circumstances, but the many other sections which are included in the industry must rely mainly on Canadian conditions to assist in the extension of business.

Toronto Topics

The concensus of opinion is that general business is in an improved condition, and this is not entirely due to expected seasonal conditions. There is, however, little definite change. A number of factors unite to give a greater sense of confidence. There is very apparent evidence of a freer money market. The progressive activity, first in monds then, as yields were lowered by rising prices, in stocks, has been significant of previous cycles in business development following a depression.

Reports from the Western Provinces show moisture conditions to be the best in a cycle of ten years. While any predictions now are of course premature, it is still heartening to be advised of good seeding conditions, and while we are apt to feel that the farmer is too insistent on his own importance, it is nevertheless surprising how much his fortune or misfortune affects general business conditions in this country. Bags, wrapping, magazines, catalogues, all wait on the farmer's prosperity to an important extent. In all converse with wholesale trade here in Central Ontario we are forced to the conclusion that the farmers is of prime importance.

From information to hand it looks as if conditions in the woods tended to a rather short driving period on the northern streams, but there has been possibly a lighter cut all round.

Conditions in the jobbing trade remain fairly steady, though in some quarters the average quantities in orders appear to be increasing. Activity in general lines depends on increased buying by individual consumers, who, however, still seem to feel that prices must be further reduced. Until this feeling disappears or is overcome by cold facts, there will be no marked improvement in the sundries that are used in active retail trade.

The pulp and paper trade in this district is decidedly optimistic and looks forward with confidence to a general brightening of business, though it is not expecting any sensational change at present.

The following notes will give an idea of market conditions.

Pulpwood — Reports coming in from the Northern districts of Ontario speak of a light cut owing to poor demand and carry over from previous season. Settlers are reported as receiving $4 to $5.00, mostly $4.50 to $5.00 per cord.

Groundwood - News Grade around $30.00 delivered Book Grade around $37.00 delivered.

Sulphite — News Grade around $65.00 delivered. Book Grade around $70.00 delivered. Bleached around $90.00 delivered.

Sulphate $70.00.

Wrappings — No. 1 Kraft 8¾c per lb. Colored Kraft 9¼ to 10¼ per lb. Maniilla 5¼ to 7½ per lb.

Bags — Discounts are now as follows: Manilla 60, 20 per cent off regular list prices. Light Kraft 60, 20, 2½ per cent. Heavy Kraft 70, 10 per cent. White Bond (Confectionery) 45, 10, 10 per cent. Manilla Wedge 60, 20, 15 per cent. White Wedge 45, 10, 10 per cent.

Tissues — Ream prices are:

No. 11 Manilla . . .	20x30	$ .90	24x36	$1.05
Nat. White	20x30	.90	24x36	1.25
No. 1 Prima White. .	20x30	1.10	24x36	1.55
White Sulphite . . .	20x30	1.00	24x36	1.40
G. C. Kraft	20x30	1.00	24x36	1.40

Toilets — in car lots, list less 20 and 25 per cent.

Towels— Interfolding $5.50 per case. I.X.L. Roll $13.75 per case less 22 per cent.

Due to some unaccountable reason the market on most grades of waste paper has eased off considerably during the past week. This applies to practically all grades with the exception of Books and Magazines which seem to be a little firmer under a strong buying action of some of the United States mills.

Dealers have been rather loath to make any price concessions, and are holding their better grades with the expectation that the slump is only temporary.

Cotton Rags still continue weak with very little movement of any grades. There has been no improvement in the New Cotton Cuttings, and the prices quoted are merely nominal, and approximate of present values.

WHAT ENGINEERING MEANS TO THE INDUSTRY

Readers of the Pulp and Paper Magazine need no further words of introduction to H. S. Taylor, Ltd. since the series of articles on the various phases of engineering as affecting the Pulp and Paper Industry which we were fortunate in securing from members of this organization have widely read and favorably commented on.

Under the title of "The Advantage of Engineering to the Pulp and Paper Industry" H. S. Taylor Ltd., have just put out a booklet containing the gist of the series just referred to and pointing out in particular the more important points at which this organization can render special service to the Pulp and Paper Industry. The list of clients and the kind of work done for them, shows that H. S. Taylor Ltd. are in a position to render a great variety of service from the planning of the power developments to the installation of equipment and organization of operating staff in the mill.

Copies of this interesting pamphlet may be had on application to H. S. Taylor, Ltd., Guarantee Blg., Montreal.

AN UNCHOKEABLE PUMP

Jones and Glassco Reg'd., of Monteal and Toronto have been appointed the Sole Canadian Agents for the Unchokeable Pump Limited of London, England.

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It has been found impossible to make the pump choke with solids or semi-solids no matter how quickly and in what quantity they may be drawn into the pump. No screens are necessary for large objects and practically anything capable of passing though the suction the pump will discharge.

Jones and Glassco are also the Canadian agents for the Morse Chain and report having an exceptionally large number of chain orders on hand.

Readers of the Pulp and Paper Magazine will be interested in the new condensed bulletin which has just been issued covering the Hardinge Conical Mill. This bulletin covers in a very consise manner the principle of operation of the mill, its adaptability to industrial and metallurgical grinding problems, and gives general dimensions covering the different types of mills, as well as tables showing sizes, powers, and capacities for different conditions of grinding. Copies will be sent on request by Hardinge Company, Incorporated, 120 Broadway New York.

In every part and corner of our life, to lose one's self, is to be gainer, to forget one's self is to be happy. **—Robert Louis Stevenson.**

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BOOK REVIEW

Bleachiing and Related Processes, as applied to Textile Fibers and Other Materials, by J. Merritt Matthews, Ph.D., author of "Textile Fibers" "Application of Dyestuffs." Chemical Catalogue Co. Inc., New York, U.S.A. Large 8 vo. 657 pp. bibliography and index.

Dr. Matthews has again presented a subject of great importance to industry in a practical manner and with due regard to related technical operations.

The treatment of subject matter is in characteristic detail covering many points which could not readily be located elsewhere. The first chapter deals with the raw fibres, minor processes, and a brief historical reference. The second chapter discusses the wool fiber with its associated impurities and their nature, industrial and chemical. This chapter contains information as to wool fats and oils which the writer has not met with in other works.

Chapters three to seven cover the scouring of wool, yarn and cloth with description of machinery and byproducts. The author refers to the great value of proper scouring before any successful bleaching can be expected.

Chapter eight covers in twenty pages the bleaching of wool, principally with sulphur dioxide and sulphites, but also covering the peroxides, permanganates, and perborates.

Chapters nine and ten deal with the boiling off or degumming of silk and its bleaching, covering twenty-five pages.

The handing and bleaching of cotton being the most important branch of all textile preparation, occupies 300 pages. Chapters eleven to fifteen being on the boiling of cotton, and sixteen to twenty-three on bleaching of cotton. The important part played in the preparation for bleaching is again emphasized.

Chapter twenty-four covers the bleaching of linen.

Chapter twenty-five in twenty pages covers the bleaching of other fibers and materials of which about two and one half pages of type refer to the bleaching of paper pulp.

Chapter twenty-six treats of the stripping of colors, seven pages.

Chapters twenty-seven to thirty-two cover in one hundred and five pages the testing of various materials used in scouring, bleaching and incidental processes.

Not the least valuable portion of the work is the Bibliography which is a silent but forceful indication of the wide field covered and painstaking labor given in the writing of this treatise.

We have, however, to record our regret that a work of such wide scope and great potential utility should suffer from the very common fault of inadequate indexing. For example, the mineral matter in silk is referred to on pages 152 and 153, but is not covered in the index either under "analysis" "ash" "mineral matter" or "silk."

Yamamai silk is indexed as page 132 but is mentioned on page 152, which, however, only refers to its content of mineral matter. "Hyraldite" is indexed before Hydration. "Hyraldite A" is mentioned pages 137 and 642, but not in the index.

Microscopy of raw and boiled-off Silk Fibres discussed on page 165, but no reference to "Microscopy" or "Silk, microscopy of" is made in the index. Incidentally the cut Figure 82, "Micrographs of raw silk" is on page 157, but is not referred to in descriptive matter page 165. However, "Tussah silk, microscopy of" is indexed as page 188. There is a cut, Figure 104, of the microstructure of Tussah silk on that page, but no description is given, and in neither case is the magnification stated, though the filaments shown in Fig. 104 are about three times the size of those shown in Fig. 82.

"Beetle" is indexed as p. 517. Reference shows only a cut. There are two more cuts of beetling machines pages 519 and 521 not indexed, nor is there any reference to "Beetling" in the text. "Ash in cotton," "Mineral matter in cotton" are both indexed p. 205 only, whereas there is more information given pp. 192, 193.

We note the use of "waxylike" instead of "waxlike," "Cegenor" instead of "Congener" (p.2), "Caustified" instead of "Causticized" (p. 233) and "reference is had" instead of "reference is made", "care must be had" instead of "care must be taken."

The text suffers in places from lack of conciseness, such as (p.219). "It is true nevertheless that where a large excess, etc." The omission of the first five words of the sentence would not affect its value in any way as a statement of fact, and would clarify the reading.

The author, not wishing to appear too dogmatic, uses the words "no doubt" in places where evidently the effect is to indicate "some doubt," else there is no reason for the use of the phrase, in such a sentence as "This is no doubt due to—".

140° Fahrenheit has the novel distinction of being considered "luke warm" on p. 30, and as a favorable temperature for fermentation on p. 225. We suggest that the author would not use that temperature for a luke warm bath. Probably 104° F. is intended in both cases.

In footnote 2, page 129 a reaction between iron pyrites and oxygen is given, with the statement that

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"100 lbs. of iron pyrites will generate 115 lbs. of sulphur dioxide." The nearest we can make it, assuming iron pyrites to be 100 p.c. FeS_2, is a little under 107 lbs SO_2.

Liquor strengths are frequently referred to in degrees Twaddle. While it might not make much difference to the practical man or one used to discussing liquor strengths, it would in the case of many readers be advisable to show relation between Twaddle and actual specific gravity in a tabular form, or at least the conversion formula.

The section on Bleaching paper pulp (535-540) is disappointingly superficial in view of the fact that in the opening paragraph the statement is made with characteristic redundancy that "the principal and largest use of bleaching powder is for this purpose."

It is a tribute to the impression made by Griffin and Little in 1894 that their table of bleach required for pulp should be incorporated in a book published nearly thirty years later, but it is hardly in keeping with the reputation of the author for being up-to-date. In this table it is stated sulphite pulp requires 15 to 25 p.c. of its weight in bleaching powder, which gives countenance to very poor practice. 15 p.c. should be the upper figure. While it is not reasonable to expect in one person a mastery of more than one industry, we believe a little consultation in the right quarter would have rounded out this work and increased largely the range of its usefulness.

In spite of its more or less important defects of presentation, and the more serious one of faulty index, the work supplies a wealth of information and will be a valuable addition to the library of the consultant as well as the worker in any of the textile and related industries. The type, binding, and presswork are well done, and the proof reading appears to have been careful.

INTERESTING TALK ON QUARRYING OF PULP STONES

H. C. Barbour, of the International Pulp Stone Company, gave an interesting talk to the Science Club of Iroquois Falls on the quarrying of pulp stones.

All pulp stone quarries, he said, were found near a river or at least near water, and generally on a hill. They had to remove, first, some ninety feet of earth and shale until they got down to the ledges. The sand stone was lying in big layers, the seams of which were horizontal.

The blocks were first taken out. Then a pattern drawn on them and they were cut and finally turned in the mill in the form that they are used in a pulp mill. He stated that no quarrying could be done in the winter owing to the action of frosts on the stone.

One of the items of interest in his talk was the statement that the stones were full of what was called quary sap, when they were first dug out, and they had to be stood on edge with the grain running downwards to let this quarry sap run out. You could not see this quarry sap running out, but it took a week before the stone was rid of it, and was in shape to work.

Considerable discussion followed in regard to soft spots in stones.

It was a very interesting and instructive talk for which the speaker was heartily applauded.

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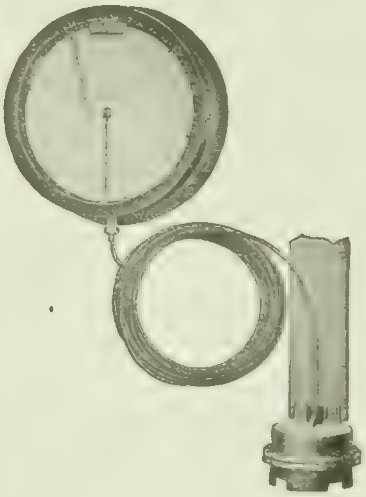

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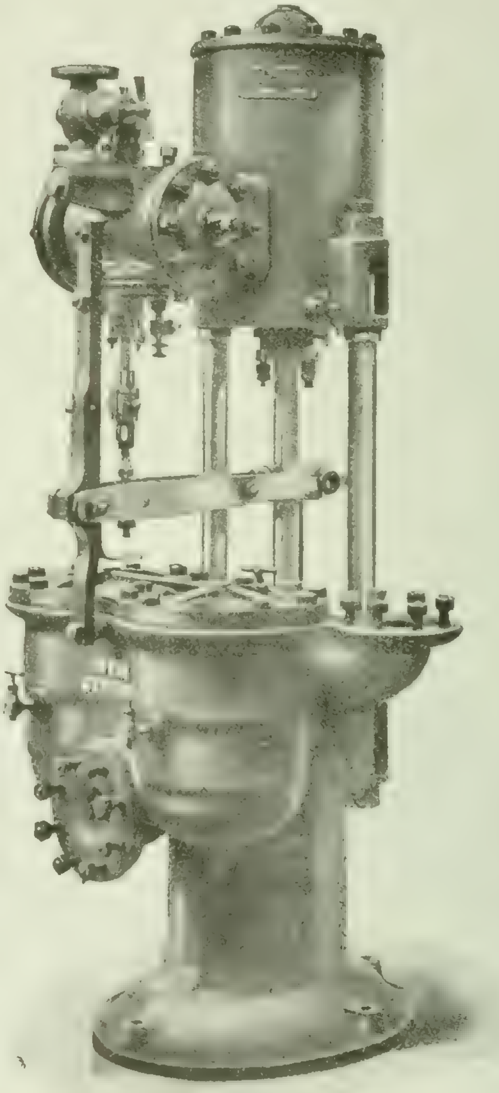

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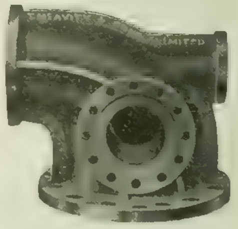

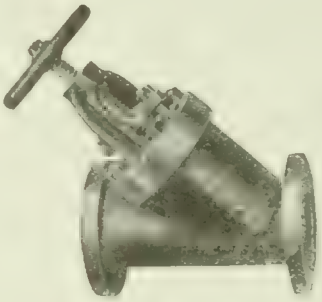

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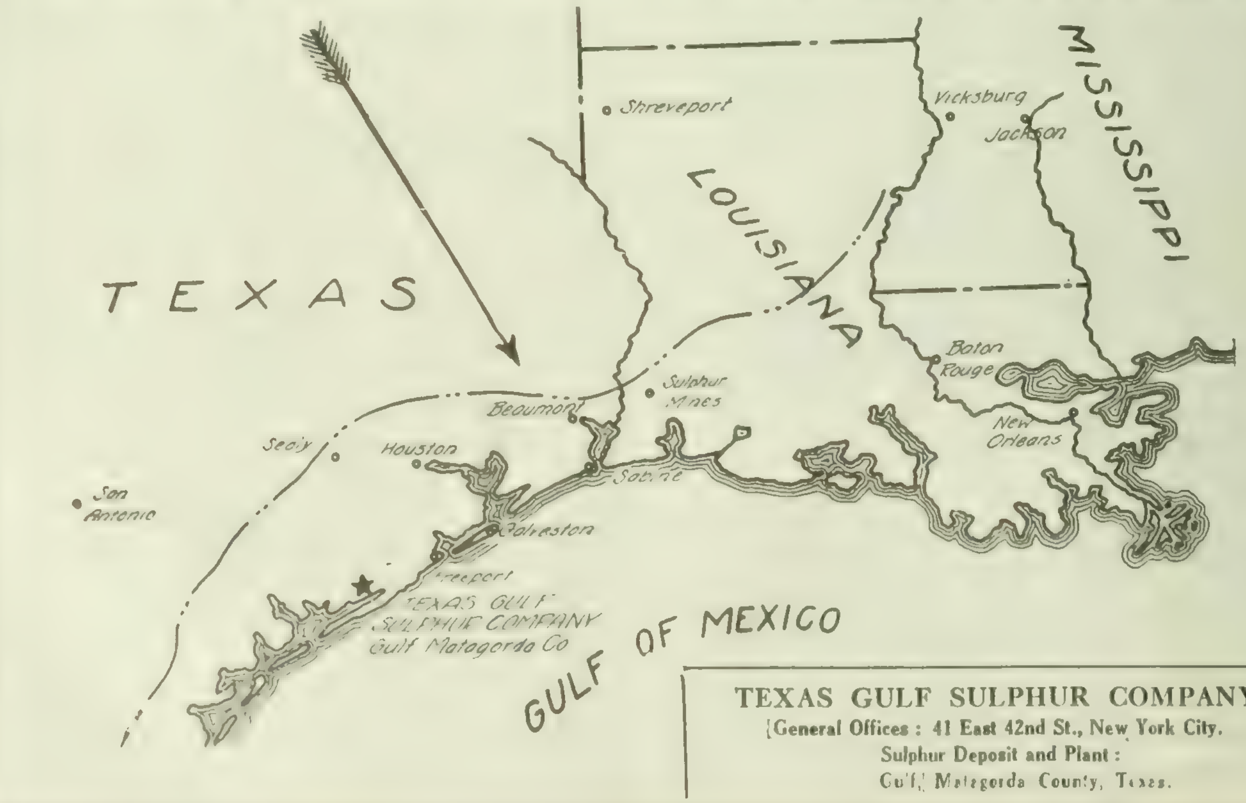

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:-: EDITORIAL :-:

APPRECIATING THE FOREMAN

When a Government Bureau takes particular notice of a certain position in industry, we may correctly assume that such a position is of considerable importance. The conviction has been growing among business men that the most important, or at least one of the most critical, subordinate positions is the foreman. This person links the management with the men. He must interpret one to the other and he must have some executive ability and should have some training in management and organization. Until very recently it has been general practice for a superintendent to promote to the position of foreman, either the most skillful operative, the person longest in the department, or a personal favorite. This system entirely overlooked what is really the most important of all qualifications for foremanship, that is, the ability to lead men and organize work. The significance of this statement is further emphasized by a moment's reflection on the fact that it is among the foremen of a plant that future superintendents and managers are very frequently found.

Some time ago the Federal Bureau for Vocational Education at Washington decided to do what they could to assist industry generally by establishing demonstration classes in Foreman Training. The first of these in the paper industry was conducted at Canton, N. C., under the auspices of the state and town and in cooperation with the Champion Fibre Co. The second was carried on at Erie, Pa., under similar auspices and in cooperation with the Hammermill Paper Co. The class is in the nature of a conference which requires concentrated attention and attendance of the foremen, but this attendance is entirely voluntary. It has been found, however, that when a man has attended one of these meetings, it would be next to impossible to keep him away from the others. The method of instruction is on the leadership plan whereby the leader points out the essentials of the executive nature of foremanship and from the men's own experience guides them in the formulation of the principles on which their work should be based. For instance, the apparently simple matter of giving an order is analysed and when once resolved into its fundamentals, any foreman can then formulate a perfectly clear, unmistakable order.

The two classes mentioned were, as has been said, demonstration classes. They were conducted by members of the Vocational Board for the purpose of showing the value of the work and illustrating the method for conducting such a class. The value of the work has been clearly seen by the paper companies and many other centres are demanding similar work in their communities. The success of the class as respects the men, can be realized when it is stated that the group at Erie voluntarily organized themselves into a study class for giving further consideration to what they have come to realize as the key to their own success in their own work. They realize that their success in their present positions is the basis on which promotion will take place and because they know that they cannot be moved ahead until they have properly trained someone to take their places, the value of this foremen training is realized in its helpfulness in helping them train their understudies.

Having thus made clear the necessity for such instruction, the Federal Board for Vocational Education, which is now under the directorship of Mr. J. C. Wright who recently made an exhaustive educational survey of the paper industry, is planning a summer conference in July to be held at Minneapolis, Minn., for the purpose of training instructors who will be qualified to conduct local classes in Foreman Training. This course is free and as another instance of the very happy relations that exist between Canada and the United States, we are very happy indeed to announce that representatives from Canada will be welcome at the conference and given such assistance as they may derive for the purpose of conducting similar work in the Dominion.

A MENACE TO OUR FINE PAPER MILLS

Once more the publishers of periodicals are attempting to secure the abolition of the 25 per cent duty on book papers, and once more the paper manufacturers are putting up a strong fight to retain the duty. The publishers desire unrestricted competition, believing that this would result in cheaper paper, to their advantage, regardless of the serious effect it would have on the paper industry. This is now recovering from a long period of depression, and the paper makers believe that this recovery will be more than neutralised if the tariff is reduced, to say nothing about its abolition.

In view of the new budget, the publishers considered the time opportune to approach Mr. Fielding in order to obtain the removal of the tariff on book papers. Mr. Fielding's views on tariffs and reciprocity are of a character to inspire the publishers with a hope that their suggestion would be favorably received. The manufacturers, however, are not asleep, and when this latest move became known Mr. Howard Smith immediately went to Ottawa and made a strong protest to the Government. This action was followed by the protests of other manufacturers, so that the Government is in possession of the objections of the paper makers.

One very forcible argument against the removal of the duty is that it would inevitably put an end to any further expansion of the industry in Canada, and would also make it very difficult for our mills to hold their present trade. The effect of such tariff legislation is illustrated by the case of the Provincial Paper Mills, Limited. As our readers are aware, this company has raised the necessary capital for constructing a new book mill at Port Arthur, Ont., in order to supply Central and Western Canada. Arrangements had been completed for the building of the mill, and a contract entered into with the Dominion Engineering Works, Limited, for the supply of a machine. Having regard to the possibility of the duty on book papers being removed, the directors decided that it would not be good policy to proceed with the enterprise. Pending the introduction of the Budget, work on the mill has been suspended, and instructions given to the Dominion Engineering Works, Ltd., not to proceed further with the machine. The final decision as to the extension will no doubt depend upon the Budget proposals, but there can be no doubt as to the wisdom of the cautious attitude of the directors in not proceeding further with an extension which might prove a burden in the event of the tariff barriers being let down. Taking into consideration the policy of the United States in restricting Canadian imports into the States, this is surely no time to give additional facilities for the easy entry of U. S. goods into this country.

It may be pointed out that, in the absence of any protection to Canadian made papers, it would be to the interest of our manufacturers to build mills on the other side of the border. They would have access to the American market, now denied them, and would also be in a position to cater for the Canadian market by reason of the free entry of the goods. Canadian mills have to pay duty on some supplies coming from the United States — duties which obviously form factors in the cost of producing paper. On the other hand, American mills are largely free from such duties, owing to the supplies being of domestic origin. To that extent our mills are handicapped, and this would be further enhanced by removing the tariff on book papers, to the serious detriment of a Canadian industry. It is not too much to say that free entry would mean the dumping of American goods — and this can only have one result, decreased production by Canadian mills and business on an unprofitable basis. — F. . D.

It is interesting to note that in spite of severe reverses and losses during the past year, English paper mills are facing the future with confidence and hope.

COBWEBS

Perhaps when the Pulp and Paper Magazine is fifty years old, we shall be able to get out as fine a special edition as the 50th anniversary number that the Paper Trade Journal has just sent out. This comes out at the time of the annual convention number but is an especially fine piece of work in commemoration of their 50th year of continuous publication. We extend our hearty congratulations to our contemporary and for its handsome and vigorous appearance at this point of middle life and trust that the older it gets the more prosperous it will be.

Another fine annual number that has come to our desk, is the convention issue of the Paper Mill. A record of many excellent annual numbers is well maintained by this issue.

Manufacturers of paper and paper products, who wish to arrange for representation in the Middle West, will be put in touch with such opportunities through the Pulp and Paper Magazine.

The net consumption of standard newsprint in the United States for the first three months of 1920, 1921, and 1922 was, respectively, 491,000 tons, 467,000 tons, and 517,000 tons, in round numbers. This is well over 2,000,000 tons per annum.

PLANS OF T. A. P. P. I. FOR THE YEAR

The Executive Committee elected at the Annual Meeting will hold its first meeting at Woronoco, Mass., on May 4 and 5, to formulate its plans for the coming year. Chairmen of the standing committees will be selected and suggestions made as to the activities desired on the part of each committee. For the committees on the manufacturing processes it has been recommended that at least two lines of work be undertaken, one along research investigation (such as in sulphite the value of estimating the alpha, beta and gamma cellulose as a practical method of establishing quality, and the factors affecting the content of each), and the other of a process nature of directly practical value.

In view of the need for lowered costs of manufacture it is believed that the work of the committees with the hearty co-operation of the members and their companies will have a very beneficial effect on the industry. During the past month the Technical Association sent out to each of its members a request for an expression of desire or willingness to serve on some particular committee or to cooperate in its work. While a number have so indicated, there is still a large proportion to be heard from. The executives of the paper and pulp manufacturing concerns should ascertain how their companies are represented in the membership of the Technical Association and encourage the co-operation of their plants in the work undertaken.

It is likely that two specific investigations will begun this year in addition to those already started. In the past year beginnings were made on the drying operation and on beating, which will be continued. The new projects contemplated are on drum barker waste and on mill effluents. The former is still regarded as a problem particularly to mills in northern United States and Canada. The latter is a problem as broad as the industry and is likely to become more acute as time goes on.

The Canadian Exporter and His Banker

Contributed to the Weekly Bulletin of the Department of Trade and Commerce by H. P. Harrison, Inspector, Foreign Department, Bank of Montreal.

A marked feature in Anglo-Saxon commerce and finance during the last few years has been the activity exhibited by banking institutions—English, Canadian, and American alike—in extending their operations into foreign fields, either by establishing branches or subsidiary institutions of their own, or by acquiring interests in other banks already established.

Certain of the leading Canadian banks had for many years prior to the war operated branches and agencies in London and New York, and in some cases in Boston, Chicago, other western United States cities, and Mexico City. The West Indies and Cuba had also been well served by two Canadian banks for a considerable number of years, and a branch of the Royal Bank of Canada was opened in Barcelona in May, 1918, while la Banque Nationale had for some time operated a branch in Paris. Apart, however, from the points mentioned and excluding Newfoundland, the direct facilities at the disposal of Canadian bankers and their exporting customers were somewhat limited, and it is most fitting that Canada's recent entry on a larger scale into the world's markets should have been accompanied by an extension of foreign banking service such as is set out below.

During the progress of the war the Government of the United States removed the restrictions which hitherto prevented the National banks from opening foreign branches, and some of these, as well as some of the more important American trust companies, have since exhibited great enterprise in establishing themselves throughout Latin America, at various points on the Continent of Europe, in London, and elsewhere. The English and Canadian Banks, fully occupied with home requirements during the war and also severely handicapped by the absence of the majority of their staff with the colours, were unable, for the time being, to adopt a similar policy, but with the signing of the Armistice a great change was noticeable in the policies of the leading banks in both countries. In England this took the form of subsidiary establishments, in addition to those already in existence, being opened by the large "joint stock" banks at various points on the Continent, while at the same time increased facilities for the handling of overseas transactions were secured by investment, by the "joint stock" banks, in the shares of the smaller banks of English ownership operating in different parts of the world.

Canadian banks at this time also displayed considerable activity in extending their foreign branches. Just prior to the Armistice the Bank of Montreal, by its absorption of the Bank of British North America, acquired an agency in San Francisco, while in 1919 a subsidiary, the Bank of Montreal (France) was opened for business in Paris, and later in the same year an important interest was purchased in the Colonial Bank, an English institution with numerous branches and a long established business in the British West Indies, British Guiana, and British West Africa.

The Royal Bank of Canada also formed an auxiliary, the Royal Bank of Canada (France, and opened for business in Paris early in the summer of 1919. The same institution then announced its intention of entering the South American field, and has since opened branches at several of the more important points in the West Indies, while the Union Bank of Canada, by participating in the formation of the Park-Union Foreign Banking Corporation, has secured facilities in Seattle, San Francisco, several important points in the Far East such as Shanghai, Yokohama, and Tokio, and also in Paris. The Standard Bank of Canada acquired an interest in the American Foreign Banking Corporation of New York, with branches in South and Central America, Cuba and the West Indies, as well as in Brussels, while the Dominion Bank participated, with various English banks, in the formation of the British Overseas Bank, Limited, established for the purpose of facilitating trade in various parts of the world, and the Merchants Bank of Canada has recently become affiliated with the International Acceptance Bank, Inc., a newly established New York organization which, it is announced, will make a specialty of financing foreign trade.

With these developments the Canadian exporter now has at his disposal, through the leading Canadian banks, exceptional facilities for the financing of his trade, branches of Canadian banks or of affiliated institutions now being in operation at the following points abroad:

Belgium.

Brussels: American Foreign Banking Corporation (affiliated with Union Bank of Canada).

China.

Shanghai: Park-Union Foreign Banking Corporation (affiliated with the Standard Bank of Canada).

France.

Paris: Bank of Montreal (France); La Banque Nationale; Park-Union Foreign Banking Corporation (affiliated with Union Bank of Canada); Royal Bank of Canada (France).

Great Britain.

London: Bank of Montreal (two branches); Bank of Nova Scotia; Canadian Bank of Commerce; Dominion Bank; Merchants Banks of Canada; Royal Bank of Canada: Union Bank of Canada (two branches).

Japan.

Tokio: Park-Union Foreign Banking Corporation (affiliated with Union Bank of Canada).

Yokohama: Park-Union Foreign Banking Corporation (affiliated with Union Bank of Canada).

Mexico.

Mexico City: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada); Bank of Montreal; Canadian Bank of Commerce.

South and Central America.

Barranquilla, Columbia: Royal Bank of Canada.

Buenos Aires, Argentina: Standard Bank of Canada). American Foreign Banking Corporation (affiliated with the Standard Bank of Canada (two branches).

Cali, Colombia: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada).

Caracas, Venezuela: Royal Bank of Canada.

Ciudad Bolivar, Venezuela: Royal Bank of Canada.

Cristobal, Canal Zone: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada).

Branches of Canadian banks or of affiliated institutions are at the service of the Canadian exporter at the following points abroad:

South and Central America.

Georgetown, British Guiana: Colonial Bank, Royal Bank of Canada.
Henrietta, British Guiana: Colonial Bank.
Mahaica, British Guiana: Colonial Bank.
Mahalcony, British Guiana: Colonial Bank.
Maracaibo, Venezuela: Royal Bank of Canada.
Montevideo, Uruguay: Royal Bank of Canada.
New Amsterdam, British Guiana: Colonial Bank; Royal Bank of Canada.
Panama City, Panama: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada).
Puerto Cabello, Venezuela: Royal Bank of Canada.
Rio de Janeiro, Brazil: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada); Royal Bank of Canada.
Rose Hall, British Guiana: Royal Bank of Canada.
San Jose, Costa Rica: Royal Bank of Canada.
Santos, Brazil: Royal Bank of Canada.
Sao Paulo, Brazil: Royal Bank of Canada.
Suddie, British Guiana: Colonial Bank.

Spain.

Barcelona: Royal Bank of Canada.

St. Pierre et Miquelon.

St. Pierre: Canadian Bank of Commerce.

United States.

Boston, Mass.: Bank of Nova Scotia.
Chicago, Ill.: Bank of Montreal; Bank of Nova Scotia.
New York, N.Y.: Bank of Montreal; Bank of Nova Scotia; Canadian Bank of Commerce; Dominion Bank; Merchants Bank of Canada; Royal Bank of Canada; Union Bank of Canada.
Portland, Ore: Canadian Bank of Commerce.
San Francisco, Cal.: British American Bank (auxiliary of Bank of Montreal); Canadian Bank of Commerce; Park-Union Foreign Banking Corporation (affiliated with Union Bank of Canada).
Seattle, (Wash.): Canadian Bank of Commerce; Park-Union Foreign Banking Corporation (affiliated with Union Bank of Canada).
Spokane, Wash.: Bank of Montreal.

West Africa.

Accra, Gold Coast: Colonial Bank.
Bathurst, Gambla: Colonial Bank.
Coomassie, Gold Coast: Colonial Bank.
Dakar, Senegal: Colonial Bank.
Ebute Metta, Nigeria: Colonial Bank.
Freetown, Sierre Leone: Colonial Bank.
Ibadan, Nigeria: Colonial Bank.
Jos, Nigeria: Colonial Bank.
Kano, Nigeria: Colonial Bank.
Koforidua, Gold Coast: Colonial Bank.
Lagos, Nigeria: Colonial Bank.
Nswan, Gold Coast: Colonial Bank.
Onitsha, Nigeria: Colonial Bank.
Port Harcourt, Nigeria: Colonial Bank.
Victoria, Cameroons: Colonial Bank.
Winnebah, Gold Coast: Colonial Bank.
Zaria, Nigeria: Colonial Bank.
Seccondee, Gold Coast: Colonial Bank.

The Antilles

Annotto Bay, Jamaica: Colonial Bank; Royal Bank of Canada.
Antilla, Cuba: Royal Bank of Canada.
Aux Cayes, Haiti: Royal Bank of Canada.
Banes, Cuba: Royal Bank of Canada.
Basse Terre, Guadeloupe: Royal Bank of Canada.
Basseterre, St. Kitts: Colonial Bank; Royal Bank of Canada.
Bayamo, Cuba: Royal Bank of Canada.
Belize, British Honduras: Royal Bank of Canada.
Black River, Jamaica: Bank of Nova Scotia.
Bridgetown, Barbados: Canadian Bank of Commerce. Colonial Bank; Royal Bank of Canada.
Brown's Town, Jamaica: Bank of Nova Scotia; Colonial Bank.
Cabaiguan, Cuba: Royal Bank of Canada.
Caibarien, Cuba: Royal Bank of Canada.
Caimanera, Cuba: Royal Bank of Canada.
Camajuani, Cuba: Royal Bank of Canada.
Camaguey, Cuba: Royal Bank of Canada (two branches).
Cardenas, Cuba: Royal Bank of Canada.
Carriacou, Grenadines: Colonial Bank.
Castries, St. Lucia: Colonial Bank.
Charlestown, Nevis: Royal Bank of Canada.
Ciego de Avila, Cuba: Royal Bank of Canada.
Cienfuegos, Cuba: Royal Bank of Canada.
Consolacion del Norte: Royal Bank of Canada.
Couva, Trinidad: Royal Bank of Canada.
Cross Roads, Jamaica: Royal Bank of Canada.
Cruces, Cuba: Royal Bank of Canada.
Cueto, Cuba: Royal Bank of Canada.
Cumanayagua, Cuba: Royal Bank of Canada.
Fajardo, Porto Rico: Bank of Nova Scotia.
Falmouth, Jamaica: Colonial Bank.
Florida, Cuba: Royal Bank of Canada.
Fort de France, Martinique: Royal Bank of Canada.
Grenville, Grenada: Colonial Bank.
Guantanamo, Cuba: Royal Bank of Canada.
Havana, Cuba: American Foreign Banking Corporation (affiliated with the Standard Bank of Canada; Bank of Nova Scotia; Canadian Bank of Commerce; Royal Bank of Canada (six branches).
Jatibonico, Cuba: Royal Bank of Canada.
Jiguani, Cuba: Royal Bank of Canada.
Jobabo, Cuba: Royal Bank of Canada.
Jovellanos, Cuba: Royal Bank of Canada.
Kingston, Jamaica: Bank of Nova Scotia; Canadian Bank of Commerce; Colonial Bank; Royal Bank of Canada.
Kingston, St. Vincent: Colonial Bank.
La Esmeralda, Cuba: Royal Bank of Canada.
La Maya, Cuba: Royal Bank of Canada.
La Romana, Dom. Republic: Royal Bank of Canada.
Limonar, Cuba: Royal Bank of Canada.
Linstead, Jamaica: Bank of Nova Scotia.
Lucea, Jamaica: Colonial Bank.
Majagua, Cuba: Royal Bank of Canada.
Mandeville, Jamaica: Bank of Nova Scotia.
Manzanillo, Cuba: Royal Bank of Canada.
Manguito, Cuba: Royal Bank of Canada.
Matanzas, Cuba: Royal Bank of Canada (two branches).
Maximo Gomez, Cuba: Royal Bank of Canada.
Mayaguez, Porto Rico: Royal Bank of Canada.
May Pen, Jamaica: Colonial Bank.

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* The Colonial Bank is affiliated with the Bank of Montreal.

Miranda, Cuba: Royal Bank of Canada.
Montego Bay, Jamaica: Bank of Nova Scotia. Colonial Bank; Royal Bank of Canada.
Morant Bay, Jamaica: Bank of Nova Scotia.
Moron, Cuba: Royal Bank of Canada.
Nassau, N.P., Bahamas: Royal Bank of Canada.
Neuvitas, Cuba: Royal Bank of Canada.
Palma Soriano, Cuba: Royal Bank of Canada.
Pinar del Rio, Cuba: Royal Bank of Canada.
Plymouth, Montserrat: Royal Bank of Canada.
Pointe a Pitre, Guadeloupe: Royal Bank of Canada.
Ponce, Porto Rico: Bank of Nova Scotia; Royal Bank of Canada.
Port Antonio, Jamaica: Bank of Nova Scotia; Colonial Bank.
Port au Prince, Haiti: American Foreign Banking Corporation (affiliated with Standard Bank of Canada; Royal Bank of Canada.
Port Maria, Jamaica: Bank of Nova Scotia; Colonial Bank.
Port of Spain, Trinidad: Canadian Bank of Commerce; Colonial Bank; Royal Bank of Canada.
Princes Town, Trinidad: Colonial Bank; Royal Bank of Canada.
Puerto Padre, Cuba: Royal Bank of Canada.
Puerto Plata, Dom. Republic: Royal Bank of Canada.
Roseau, Dominica: Colonial Bank; Royal Bank of Canada.
St. Ann's Bay, Jamaica: Bank of Nova Scotia; Colonial Bank.
St. George's, Grenada: Colonial Bank; Royal Bank of Canada.
St. Johns, Antigua: Colonial Bank; Royal Bank of Canada.
Saguala Grande, Cuba: Royal Bank of Canada.
Sanchez, Dom. Republic: Royal Bank of Canada.
Sancti Spiritus, Cuba: Royal Bank of Canada.
San Fernando Trinidad: Colonial Bank; Royal Bank of Canada.
Sangre Grande, Trinidad: Royal Bank of Canada.
San Juan, Porto Rico: Bank of Nova Scotia; Royal Bank of Canada.
Santa Clara, Cuba: Bank of Nova Scotia.
Santiago, Cuba: Royal Bank of Canada.
Santiago de los Caballeros ,Dom. Republic: Royal Bank of Canada.
Santo Domingo, Dom. Republic: Bank of Nova Scotia; Royal Bank of Canada.
San Pedro de Macoris, Dom. Republic: Bang of Nova Scotia; Royal Bank of Canada.
Savana-la-Mar, Jamaica: Bank of Nova Scotia; Colonial Bank.
Scarborough, Tobago: Colonial Bank; Royal Bank of Canada.
Silveira, Cuba: Royal Bank of Canada.
Spanish Town, Jamaica: Bank of Nova Scotia; Royal Bank of Canada.
Speightstown, Barbabos: Colonial Bank; Royal Bank of Canada.
Trinite, Martinique: Royal Bank of Canada.

In addition to the developments already mentioned, the reciprocal arrangements existing prior to the war between Canadian banks and their correspondents abroad, have, in the majority of cases, been revised and considerably extended during the last two years, so that at the present time the Canadian banks are in a position to handle efficiently and expeditiously the transactions of their customers with all parts of the world, exceptions of course being understood in the case of those countries where disturbed conditions render normal banking service impossible.

Besides rendering the usual services to the exporter in negotiating or collecting his drafts on his foreign customers, the leading Canadian banks also place at his disposal the services of their Foreign Trade Information Bureau, which, so far as banks are concerned, are a development of the last few years. By availing themselves of the services of these Bureaux, exporters are able to obtain a great deal of valuable and up-to-date trade information; data and statistics of every kind which are considered likely to be of value to the exporter are tabulated in readily available form, and the banks are prepared, through their foreign branches and correspondents, to conduct investigations as to the prevailing conditions in different foreign countries and the markets which exist, or which might be developed, for the goods in which their customers are interested.

Information is kept on file covering available shipping routes and facilities, and the Customs tariffs, invoice requirements, business procedure, and other matters of interest concerning the leading countries of the world.

An important feature of the activities of these Information Bureaux is the furnishing of lists of foreign importers of the different commodities which Canada is able to export, and the banks' services may also be enlisted in the selection of agents to represent Canadian exporters in the different markets of the world. As an example of the assistance which the Canadian banks are rendering to their exporting clients, may be cited a recent step on the part of the foreign department of the Bank of Montreal, which conducted a canvass of the bank's customers to ascertain the names of those interested in exporting goods to the West Indian and West African colonies. The names of these firms, classified according to the commodities dealt in, were listed and placed in the hands of the different branches of the Colonial bank throughout the West Indies, British Guiana and British West Africa, and the number of enquiries received by the bank's customers as a result of this progressive policy bears ample evidence of the assistance which the banks are enabled to place at the disposal of their clients.

Credit reports on foreign firms are gathered by the foreign departments, and this information is constantly being revised and kept up to date. The banks are glad to answer inquiries from firms interested in export trade, and a service of this nature, which in most cases is at the disposal of their customers free of charge, cannot fail to be of the greatest assistance in the development of overseas markets. The rapidly increasing extent to which exporters generally are availing themselves of the service is an excellent indication of the value of such assistance.

"A man who boasts he never changes his mind after it is made up," says Trude Hills, "is about as valuable as glue-pot that has glued its own stopper in."

"The inner side of every cloud
  Is bright and shining,
And so I turn my clouds about,
And always wear the inside out,
  To see the lining."

Most people would enjoy themselves if they would stop worrying over things that never happen.

Imports From Germany Into South Africa

A very encouraging note struck by Trade Commissioner W. J. Egan, in his communication of Nov. 24, 1921 from Cape Town to the Canadian Department of Trade and Commerce. Paper makers should be specially interested in his message.

There would seem to be a desire, almost universal on the part of manufacturers, exporters and importers within the Empire, to "boost" Germany's exports. With importers here — and one sees a glimmer of the same thing in Canadian papers — it is an obsession that there is only one country in the world able to quote, and the writer has heard in despondent tones time and again: "Germany is capturing the world's trade"; "Your prices are too high"; "Germany has you all beaten and is flooding the market."

This is really all part and parcel of German propaganda for trade, and the methods of commercial penetration are so clever and insistent that the great majority of importers are, quite innocently it is true, "boosting" Germany's ability. One could cite many instances of quotations in certain lines, orders placed, but no deliveries, at the phenomenal prices of which so much is heard.

Getting down to facts, Germany is shipping in good quantities only in those lines in which she was competing before the war, and in a fair way on some articles which other sources of supply, in their panic-stricken condition, are opening to them.

There is no question that, instead of lying down on the job, German exporters, with their carefully worked out system of representation and displays of samples, are very much in evidence. It is also a fact that German exporters are making sure with their tenders for large contracts in such lines as machinery, piping and other heavy lines, by quoting anywhere from 25 per cent to 50 per cent below other tenderers. Yet it is found, on this class of work and all regular merchandise shipped, that, even at this late period in 1921, with all the boasted cheapness of German goods, quotations are on the average more than double those in 1913.

This "capturing of the world's trade" by Germany is all a "bogie," but other exporting countries are in their several ways helping to make it so awe-inspiring that for the time being they are blinded to the real facts of the situation. The trouble is that, outside of Germany, workmen and manufacturers, producers and traders are forgetting that the past few years have been soft and easy for them: the workmen with limited output and no limit inwages, the others with prices and, therefore, profits, which were really not set by themselves but by the purchaser of their goods in keen competition to obtain supplies. The Germans, on the other hand, had no overseas trade for years, and when they began to take it up once more, they had no temptation to continue or to wish for a continuation of the soft and easy period in trading, because for them there had been none. Accordingly they began with a will and at speed of production which they had maintained in pre-war, days, and have even speeded up beyond that point, and yet they are far from capturing the world's trade. It is bogie pure and simple; and if Canadian workers, manufacturers, producers and traders would only look the soft and easy period as a blank in real endeavour, and get back co-operation, turn-out and production at least on a 1913 scale, it would mean for a certainty that the easy time we are now giving the Germans in securing so much of their old trade, would be at an end.

A study of the Customs statistical statement of the Union of South Africa for September, covering nine months of the year, will certainly be a surprise to exporters who are afraid of the "German bogie." Knowing, however, from a close follow-up, and from getting down to hard facts time after time when interviewing buyers since the month of May last, the writer has not been surprised to find that, out of a total import of $190,016,000 into South Africa, Germany's share of the trade was only $3,633,500—less than 2 per cent of the total; and in this connection it must be remembered that quantity values were, of necessity, much less in 1913.

That the "capture of the world's trade" by Germany is only a bogie as far as South Africa is concerned, is clearly shown in the following details, specifying imports from Germany into the Union for the first nine months of this year. On most of the lines cited she has special advantages in quoting, and yet her proportion of the total is, with few exceptions, nothing like pre-war.

In newsprint imports, which totalled for the first nine months of this year 134,631 cwts., Germany shared to the extent of 7,492 tons, valued at $66,650. To which should be added in other printing paper, out of a total of 69,922 cwts., a weight of 955 cwts. from Germany, valued at $16,000. There are no quantities shown for 1913, but in that year Germany was credited with an important value of $65,000.

Canada's real competition is from other countries on the Baltic, who are making a very real bid for next year's tonnage, but as the trade here are anxious to continue to make the greater part of their purchases within the Empire, it is sincerely trusted that our exporters will do their share in supporting the wishes of the importers in South Africa.

In wrapping paper, pre-war Germany secured in value an annual average of $70,000. This year, out of a total import of 55,563 cwt., the German share was 1,312 cwt. valued at $15,400. In stationery, not including books or printed matter, the total imports were valued for the first nine months of the year at $2,236,000, of which $38,900 was Germany's share.

A summary which has been made of imports from Germany confirms the opinion expressed that Germany is not the menace to Canadian overseas markets that our manufacturers and traders generally are permitting themselves to believe.

With very few exceptions, in all articles of import in which Germany has recovered her South African trade there is a big enough margin left in quantity of import on which Canadian manufacturers may make an endeavour, and if all interests are working for the general good in output, reasonable margin of profit, good packing, the required shipping documents up to date, ocean freight rates competitive with the Baltic, with Canada's good reputation for quality and character in her exports, Canadian trade with South Africa is sure to increase, as all importers, without exception, state they will be glad to purchase all they can in the Dominion.

Certificate of Origin for the Bahama Islands

Persons desiring a copy of the form of certificate of origin required in the Bahama Islands for entry of goods under the preferential tariff as provided for in the Canada-West Indies Trade Agreement may obtain it on application to the Director, Commercial Intelligence Service, Ottawa.

Importance of Combustibles

Furnace efficiency should be considered separately from boiler efficiency, and the master key to the proper testing of furnace efficiency is continuous gas analysis, which not only measures the excess air present at all times, but **also promptly detects and meaures the presence of combustible gases in the flue whenever they appear.**

What Savings are Possible.

When coal is burned in a boiler furnace under ordinary conditions, an average of about 65% of the heat generated is used to make steam, 25% goes up the chimney, and the balance is lost through radiation and in the ashes. How important it is to hold the chimney losses down to a minimum becomes evident when we consider that every decrease in chimney losses results in a proportionate saving of heat available for steam making.

To produce steam representing 1,000 units of energy, it is necessary, on the 65% efficiency basis above described, to consume approximately 1,538 units of energy as it comes in the fuel. Now suppose the chimney losses are reduced from 25% to 15%, which is not unusual, and that the 10% thus saved are turned into useful energy, making this 75% of that supplied in the fuel. Then, to produce 1,000 units of useful energy requires only 1,333 units of energy as supplied in the fuel. The difference between 1,538 and 1,333 is 205, and this is nearly 15½% of 1,333, the fuel actually required to carry the load under the more economical conditions. In other words, the saving in fuel represents 15½% of what is necessary under the more efficient operating conditions.

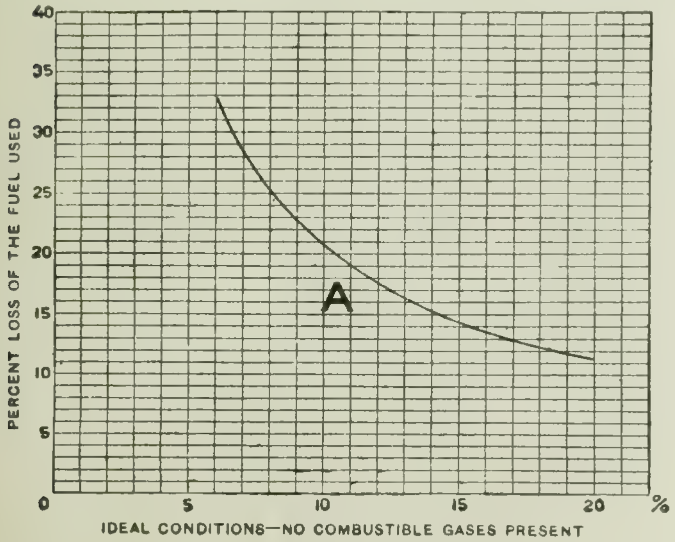
Kinds of Chimney Losses and Their Relative Importance.

Heat is lost up the chimney in two distinct forms, namely, the sensible heat of the entire volume of flue gases, and the heat representd by the chemical energy in unconsumed combustible gases. The amount of the sensible heat is a function of the temperature and the volume of the flue gases. The amount of heat lost in the form of chemical energy is a function of the volume. The loss of heat represented by a certain percentage of unburned combustible gases in the chimney is much greater than the loss of heat due to excess air represented by an equivalent percentage of CO_2.

To completely burn fuel, a surplus of air is always necessary over what would be theoretically correct. The amount of this surplus varies constantly, depending upon the many different factors that influence combustion. However, maximum efficiency under practical conditions is attained when there is just enough surplus air to make complete combustion possible, that is, combustion without the escape of combustible gases up the stack. It is that point where a reduction in the air supply results in incomplete combustion, and an increase in the air supply results in an unnecessary waste of energy through the carrying away of sensible heat by excess volumes of flue gases.

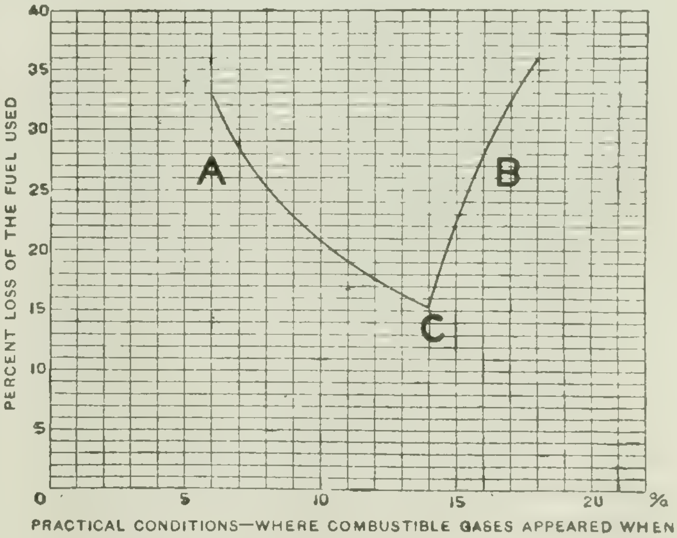
An idea of the magnitude of the fuel losses due to the escape up the stack of combustible gases when the air supply is unsufficient as compared to the losses due to the presence of excess air may be gained by a comparison of the curve showing the fuel losses which take place with varying percentages of CO_2 (varying inversely with the excess air supply) in the flue gases, **providing** there are no combustible gases present. However, combustible gases (CO, CH_4 and H_2) are bound to begin to form at some point as the percentage of CO_2 is increased (air supply decreased) and, as mentioned before, losses due to the formation of these combustible gases are far greater in proportion to their volume than losses indicated by equivalent proportions of CO_2. This is graphically illustrated in Fig. 2, where the proportion CB in the curve represents fuel heat losses that develop beyond the point C where combustible gases begin to form as the percentage of CO_2 is still further increased by reducing the air supply.

The point C is **the critical point.** It is the point where combustion takes place with the greatest economy in fuel consumption. It varies not only in different furnaces, but varies constantly in the same furnace.



IDEAL CONDITIONS—NO COMBUSTIBLE GASES PRESENT

FIG. 1



PRACTICAL CONDITIONS—WHERE COMBUSTIBLE GASES APPEARED WHEN CO_2 PASSED 14 PERCENT

FIG. 2

PERCENT OF CO_2 IN FLUE GASES—INCREASES WITH DECREASING AIR SUPPLY

The curves shown were plotted from generally accepted average values. On that basis, the following comparisons are interesting. Let us assume that when CO_2 is 14%, combustion is taking place under conditions of maximum efficiency in the furnace. The unavoidable loss under these conditions is 15.3% of the total fuel used. Let us assume that only 1% of combustible gases forms for every percent increase in CO_2 beyond this point. Taking into account the heating value of these combustible gases, calculations show that when the percentage of CO_2 reaches 15, the fuel loss is 22%, and when the percentage of CO_2 has reached 16, the percentage of fuel loss becomes 28.

What CO_2, CO, CH_4 and H_2 in the Flue Gases Tell About Combustion.

Many power plant engineers consider it foolish to place much confidence in CO_2 readings, and make it a general rule never to allow the CO_2 present to exceed 10 to 12%. Others put it as low as 8 to 10%. Under these conditions, there is likely to be a great waste of fuel due to the avoidable escape of sensible heat up the chimney. In contrast with these there are authorities who claim there is no danger of having combustible gases escape unconsumed before CO_2 reaches a point above 15%.

The fact of the matter is, combustible gases may appear with any percentage of CO_2, and depending on CO_2 records alone is therefore decidedly misleading and illusory. It is quite possible to have large volumes of combustible gases. (CO, CH_4 and H_2) present simultaneously with a low percentage of CO_2 as well as a high percentage of CO_2. For example, if the fire in one part of the furnace is very thick or dirty, CO would be generated in that part and escape unburned because not enough air would be going through. If, at the same time, there is an air hole in another part, air would rush through there unused. Under these conditions CO would be found present at the same time that the record would indicate excess air by a low CO_2 reading.

The percentage of CO_2 for economical combustion may vary considerably from time to time in the same furnace with the rate of combustion, method of firing, thickness of the fire bed, distribution and character of the fuel, draft, formation of ashes, dirt and clinkers, and many other influences which are subject to irregular variations, and which have a decided effect upon the completeness and efficiency of combustion with any given air supply.

Generally speaking, low CO_2 indicates excess air, but may also indicate that the air is poorly mixed, giving rise to a simultaneous formation of CO. It is therefore not desirable to attempt to secure a high percentage of CO_2 by cutting down the draft alone. A high percentage of CO_2 can be obtained with practically any draft, so long as it has the proper relation to the fuel bed resistance.

On the other hand, the losses due to the formation of combustible gases which are allowed to escape up the chimney without being burned are frequently much greater than the losses due to excess volumes of air, because it is quite possible to reach a very high percentage of CO_2 while simultaneously producing large volumes of combustible gases (CO, CH_4 and H_2).

Insufficient air supply is the most general cause of the presence of CO in the stack. CO may, however, be present due to the poor design of the furnaces, improper methods of firing, the coal being of a character not adapted to the equipment with which it is burned, poor mixing of the combustible gases with the air and low furnace temperature, which causes gases to be cooled below the ignition point before combustion is complete.

Occasional snap tests for CO with hand instruments to check up the CO_2 recorder have therefore proven entirely deficient in properly controlling combustion. Recording CO_2 alone has never, under any condition, given results even approaching the possibilities of economical combustion, and it is positively known that the maximum economy in fuel consumption cannot be realized by any of the old fashioned methods.

Facts About Combustion In A Furnace Not Generally Recognized.

The oxygen used in the process of combustion in a furnace comes from two sources, namely, the primary and the secondary air supply. The primary air supply is that which flows through the combustible material in the fire bed. The secondary air supply is that which is admitted to the combustion chamber above the fire through holes in the fire bed. The secondary air supply is that which is admitted to the combustion chamber above the fire through holes in the fire bed, the fire doors, through leaks in the boiler settings, etc. It supplies the free oxygen necessary to oxidize the combustible gases generated in the fire bed.

The Bureau of Mines has conducted exhaustive experiments to determine what actually happens when coal is burned in a furnace. It was discovered with one fuel, that when the fuel bed is over 4" thick, and free from air holes, a furnace without secondary air acts very much like a gas producer. In a fuel bed 12" thick, where no secondary air was supplied, practically all the oxygen was consumed 4½" from the bottom of the fire. At this point CO_2 reached 14% and combustible gases registered 10%. About 26% of the gases leaving the top of the fire were combustible gases, while the percentage of CO_2 was reduced to 7. Le Chatelier states that CO_2 generally reaches a maximum at a height in the fuel bed ten times the diameter of the coal pieces. From this point on reduction of CO_2 takes place.

The combustion of coal in an ordinary boiler furnace thus takes place in two stages. In the first stage, the fuel bed acts as a gas producer, producing CO and other combustible gases in large volumes. In the second stage these combustible gases are mixed with the secondary air and the carbon in the CO and other combustible gases is oxidised to CO_2, and the hydrogen combines with oxygen to form water vapor.

Contrary to the generally prevailing impression, the volume of the secondary air required to burn coal in a furnace is greater than the volume of the primary air. If the coal were all carbon, the volume of the secondary air required under ideal conditions would be the same as the volume of the primary air. In the first stage of combustion the reaction would be $2C + O_2 = 2\ CO$. In the second stage it would be $2\ CO + O_2 = 2\ CO_2$. In other words, the volume of air required to convert the carbon into CO in the primary stage is the same as the volume of air required to burn the CO into CO_2 in the secondary which come off in the first stage of burning coal. To burn these additional gases, secondary air is required. Inefficient mixing of the combustible gases in the combustion chamber with the secondary air supply gives rise to still further demands for excess secondary air, that complete combustion may take place. How much secondary air is required depends on the furnace design, kind of stoker, method of firing, kind of fuel, etc.

Nobody can tell anything about the volume of the secondary air, where it all comes from, how much enters through the various known channels, or what its proportion to the total air supply is. It is generally recognized, however, that the one safe rule is to keep it at the least possible minimum necessary to ensure complete combustion of the combustible gases. This can only be done by a constant watch for the appearance of combustible gases in the flue, while holding the percentage of CO_2 at the maximum point which can be maintained without the appearance of such combustible gases.

Holes, ashes, clinkers, or dirt in the fire, thickness of the fuel bed, draft, length of time of opening of fire doors and regulation of dampers—all cause wide and irregular fluctuations in the amount of secondary air admitted. While the amount of this secondary air has such a decided and important effect on the economical combustion of the combustible gases which are formed in the fire bed, it is a most bewildering and hopeless task for the fireman to attempt to control it scientifically, or to form any conclusions, or to make estimates based on direct observation regarding the proportion or amounts of this secondary air entering at any time. To achieve efficient furnace results, some clear, simple means should therefore be provided for telling him just how much excess air is present at all times, and to give him prompt warning of the appearance of combustible gases in the chimney. Such means act as a guide to the fireman, enabling him to intelligently regulate his fires and to manipulate to the best advantage the controllable elements which determine the admission of excess air to the combustion chamber.

The best method of firing a particular furnace, and regulating the air draft and dampers, can only be determined by trying various ways and means a carefully watching the results recorded from the analysis and recording of both CO_2 and combustible gases. Only through such a procedure can the fireman learn by experience what must be done, and what must be avoided to give the maximum percentage of CO_2 at all times without the loss of combustible gases up the flue. Without such a continuous and complete record of CO_2 only, he is working blindly in the dark, and can tell nothing about the results of his various efforts towards attaining higher combustion efficiency.

Correct mixing of the air and the volatile combustible products of the furnace is a matter of greatest importance, and represents one of the most difficult problems of design the combustion engineer has to contend with in his efforts to cut down the amount of excess air necessary to insure complete combustion and to reduce the possibilities of having unconsumed combustible gases escape up the shimney. Stratification, having the process of mixing take place too slowly, or premature cooling of the mixture below the ignition point—all lead to waste.

How nearly combustion in practice can reach the ideal is well represented in certain boiler plants where blast furnace gas is the fuel. By means of a multiplicity of interspersed small air and gas orifices such a thorough, intimate mixture of the fuel and air is obtained that the percentage of excess air necessary to insure complete combustion has been practically reduced to zero. On the other hand, it is not at all uncommon to find in small coal burning boiler plants where hand firing is used, that the CO_2 in the flue gas analysis registers as low as 4 %, showing the presence of 420 % excess air.

In a paper by Ambrose N. Diehl on "Modern Methods of Burning Blast Furnace Gas Under Stoves and Boilers," the following statement appears: "In view of the fact that 1 % of CO in flue gas containing 18 % of CO_2, adds approximately 6.5 % to the losses, and the proportionate larger amount in more dilute gases, it becomes apparent that a high degree of accuracy in the CO determination is very desirable. For this reason, efficiencies based on analysis of a CO_2 recorder are not dependable." He states further that constant gas analysis and intelligent supervision are the principal factors in obtaining continuous good efficiency and control without changes in equipment. Similar statements hold good where coal is the fuel.

Essentials in the Attainment of Maximum Economy in Combustion Control.

Only by continuously recording the percentage of CO_2 as an indicator of the amount of excess air present, and also detecting and clearly recording the presence of combustible gases (CO, CH_4 and H_2) immediately they are present, can effective combustion control be established. By no means is it possible to avoid unnecessary loss at all times in the combustion of fuel, either due to an excess supply of air or through the loss of combustible gases up the chimney.

Graphic records of such a combination of simultaneous gas analysis, considered in conjunction with other records and the various functions in boiler room operation, not only point the way toward improving combustion in a given furnace, but are also an indispensible guide when, to improve combustion, alterations or reconstruction of a furnace are considered. At such times, the grate, combustion space, baffles, arches, wing walls, dampers, settings, chimney or mechanical draft, etc., all come under consideration.

Recently an instrument has been perfected and placed on the market, which not only accurately analyzes and records the percentages of CO_2 present at all times in the flue gases, but also promptly detects and clearly records on one and the same chart the presence and the approximate proportion of combustible gases whenever they appear.

Mr. Olof Rodhe, chief engineer of the Mono Corporations, states that his experience with a great many plants both in America and Europe has conclusively proven that "economical combustion is possible only when combustion control is based on records indicating not only excess air, but also the presence of combustible gases due to an insufficient supply of air. Combustion control on the basis of CO_2 alone, with an occasional snap reading of CO is not effective. Only by simultaneously and continuously analyzing and recording the percentages of both CO_2 and combustible gases present in the flue at all times can the maximum economies be attained in fuel consumption. These requirements have been successfully met by the new Duplex Mono Gas Analyzing Instrument, of which Mr. Rodhe is the inventor.

One of the prime purposes of the Duplex Mono is to detect the presence of combustible gases in the flue immediately upon their appearance, and to record accurately the percentage of CO_2 present **at that particular time.** It is so sensitive and accurate in the performance of this function, that it will unfailingly detect and record with the least possible delay the presence of even such minute fractions as one tenth of one per cent. of combustible gases in products of combustion. Even this slight proportion is clearly recorded on the chart, so its presence is easily detectible by the operator at a glance. The presence of combustible gases once established, the accurate determination of their actual percentages is not of any importance. The instrument indicates approximately the degree in which they appear, and that is sufficient for the guidance of the fireman. The actual percentage present is rarely less than two thirds, or more than equal to the amount recorded on the chart.

Even where the old conditions were considered as most favorable, the installation of these instruments has repeatedly demonstrated that incomplete combustion was prevalent to a far more serious degree in modern boiler plants before the new method of control was adopted, than was ever suspected.

Fig 3 represents a diagram made by one of these new double-recording instruments. The lower contour of the diagram accurately represents the percentages of CO_2 present at all times. The lighter areas in the diagram indicate the presence of combustible gases (CO, CH_4 and H_2). The proportion of combustible gases present is roughly indicated by the height of the lighter areas at any particular time.

Looking closer at this diagram, it will be seen that at the point C farthest to the left, combustible gases began to form when the percent of CO_2 was 10, and the amount of combustible gases formed increased rapidly, as the percentage of CO_2 increased to 11 %, only to vanish again when the percent of CO_2 was again reduced to 10 %. At point C to the right, combustible gases begin to form again, this time, however, when CO_2 is only 8½ %. This shows that between 4:30 in the morning and 3 o'clock in the afternoon, changes have taken place in the furnace conditions such that while combustible gases began to form when CO_2 was 10 % early in the morning they began to form when CO_2 was only 8½ % in the afternoon. Should the operator keep CO_2 at 10 % all day long, it is evident that serious losses might take place as in this case between 3 and 4 o'clock in the afternoon, as indicated in the right hand part of the diagram. That is what happens when the maximum allowable CO_2 is determined for an indefinite period by a snap CO_2 test.

Diagram 3, which we have just discussed, shows the condition found in a boiler plant at the time the instrument was first connected, and the furnace was operated on the old principle. Certain changes were made in the furnace, the nature of the fuel and the method of firing, with the result that conditions as illustrated in diagram 4 were obtained. In this diagram it is seen that CO_2 could be carried to a point as high as 13 % without the formation of CO. In other words, the critical point was raised several points higher on the diagram, the reduction in air supply without formation of combustible gases resulting in a save of 20 % in fuel. With such a record always before him, the operator is always in a position to follow closely any variations in the positions of the critical point and knows immediately when combustible gases begin to escape unburned up the chimney. Where the dark contour goes below the critical point, too much air is supplied, or there is improper distribution of air. Where, on the other hand, the dark contour rises above the critical point, that is, the point where light areas begin to show, the supply of air is insufficient.

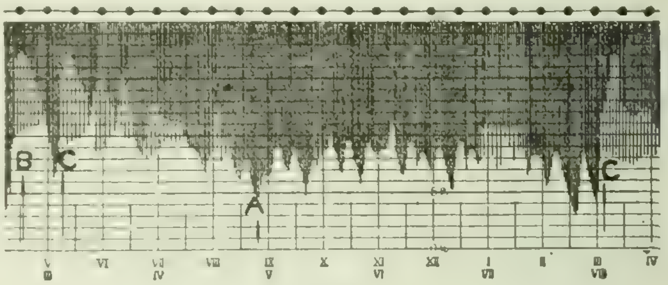


FIG 3

General Characteristics of the New Combustion Control Instrument.

The apparatus (see Fig. 5) is driven by water pressure of about 10 lbs. per square inch. Before entering the instrument, the gas samples from the flue are pulled through a filtering system, which removes all traces of soot and dirt. They are then drawn into and forced through the apparatus by a mercury piston. There are no mechanical valves, such functions as these ordinarily fulfill being performed by various kinds of mercury seals, traps, etc.

Samples of gas are forced alternately through two routes; one leading directly through a caustic potash tank where CO_2 is absorbed, and the other first through an electrically heated furnace wherein the combustible gases are oxidized to CO_2 and H_2O, and then through the caustic potash tank. Samples that are forced through the caustic potash tank only give the readings for CO_2. Those that are first forced

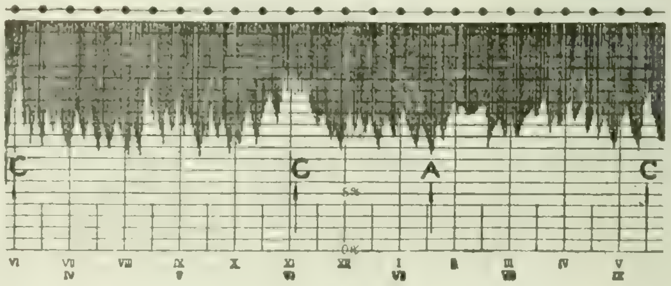


FIG 4

through the electrically heated furnace and then through the caustic potash tank, give readings of CO_2 plus combustible gases. The difference between any two successive readings is proportional to the amount of the combustible gases present at the time the analyses are made.

In the electrically heated furnace, the oxygen necessary to oxidise the combustible gases, CO, CH_4 and H_2 to form CO_2 (which is later absorbed in the caustic potash tank) and water (which is condensed) is usually taken from the air which is almost invariably present. When such free oxygen is not available, oxygen is taken from copper oxide provided in the furnace for that purpose. The copper oxide, however, probably seldom acts as anything but a catalytic agent and need never be renewed.

Should any of the copper oxide be reduced to plain copper to oxidise combustible gases in the process of analysis, it is reoxidized by oxygen present in the flue gas samples passing through the electric furnace later.

To diminish the lag between the time when the gas leaves the flue and the analysis is recorded on the chart, small communicating tubes are used. The lag between the time that the sample is taken from the flue to the time that it is recorded by the instrument is about 3 minutes where the distance between the instrument and the point where the flue is tapped is about 60 ft. and the instrument is making about 4z analyses per hour.

These instruments are made to produce records covering a range of either 20, 25 or 40 %, according to the purpose for which they are intended. The 20% range is the most common. A range shifter can be provided so that the position of the range is adjustable, that is, the 20 % range, for example, can be set between 0 and 20, 5 and 25 %, 10 and 30 %, or between any other limits at the will of the operator.

The recording pen, when at its highest position, comes into contact with an ink container having a two weeks' supply of ink. The ink in the pen is automatically replenished every time it returns to the high point on the chart.

The apparatus is practically dustproof and requires only a slight amount of attention, which consists in winding the clock once a week, replacing the caustic potash solution two or three times a month, replenishing the ink supply twice a month, and putting in new rolls of paper once every two months.

Accuracy of Records and Their Values.

The readings indicating the presence of combustible gases are exaggerated, if anything, by the Duplex Mono. This is quite an advantage in a danger signal. The losses due to the appearance of combustible gases are much greater than the savings due to an equivalent increase in CO_2 as registered on the chart, and an exaggerated record of their presence on the chart has a favorable effect on the fireman. Since it is aimed never to have combustible gases present at any time anyhow, there would be no object in having exact records of the percentage present where they do appear. An approximate, and preferably an exaggerated record, is all that is necessary, and this is the kind of record made by this instrument.

Why the records of percentages of combustible gases are not exact, is explained in the following paragraphs. The discussion of these phenomena is, however, of little practical importance, since the object of prime importance is to detect and record combustible gases as soon as they are found and to know exactly what the percentage of CO_2 is at that time. While the degree in which combustible gases are present need be known only approximately, the percentage of CO_2, on the other hand, should be accurately known at all times, and particularly at the time combustible gases begin to appear, so the fireman may always know how high he may carry this percentage of CO_2 under the best conditions without running into the danger of generating combustible gases, and how near he is to this point when combustible gases appear at other times, so he may handle his furnace accordingly.

Where CO, CH_4 and H_2 are oxidized through the addition of oxygen taken from the copper oxide in the electric furnace, the volume of the flue gases is not affected by their passage through the apparatus other than by the removal of these gases. The reactions are as follows:—

$$2CO + 2CuO = 2\ Cu + 2CO_2$$
$$2H_2 + 2CuO = 2H_2O + 2Cu$$
$$CH_4 + 4CuO = CO_2 + 2H_2O + 4Cu$$

After leaving the electric furnace, the H_2O is condensed, and the CO_2 is absorbed in the caustic potash solution. The records of combustible made by the instrument under these conditions are therefore in exact conformity with the proportions of these gases removed. A large excess of copper oxide is always carried in the furnace, so that the apparatus can run a long time analyzing great quantities of combustible gases continuously without running short of oxygen, should no free oxygen be available in the flue gases for extended periods.

When, in the process of oxidizing CO, the oxygen is supplied by air present in the flue gas sample, the chemical reaction is as follows:—

$$2CO + O_2 = 2CO_2$$

Two volumes of carbon monoxide combine with one volume of oxygen to form two volumes of carbon dioxide, which is later absorbed in the caustic potash solution. Since three volumes of gas are thus removed to record two volumes of CO, the actual volume of CO present is, under these conditions, only two thirds of what the record shows.

When CH_4 is oxidized with free oxygen from the air present in the flue gases, the reaction is as follows:—

$$CH_4 + 2O_2 = CO_2 + 2H_2O$$

One volume of CH_4 plus two volumes of oxygen produces water, which is condensed and one volume of CO_2 which is later absorbed in the caustic potash tank. In other words, three volumes of gas are removed from the sample for each volume of CH_4. Under these conditions, the percentage of CH_4 present is just one third of that recorded by the instrument.

When hydrogen is oxidized through the addition of oxygen in the air, the following chemical reaction takes place:—

$$2H_2 + O_2 = 2H_2O$$

The water is condensed and removed in liquid form. Three volumes of gas (2 of hyrogen and 1 of oxygen) are thus removed for every two volumes of hydrogen present. Consequently, the amount of hydrogen actually present is under these conditions but two thirds of what the instrument indicates.

Sufficient free oxygen is almost invariably present in the flue gases to oxidize the combustible gases there without resort to the oxygen supplied by the copper oxide. Even in the rare instances where this is not the case; many years of experience and innumerable tests in plants of every description under all kinds of conditions have conclusively demonstrated that the readings of the instrument are never affected by the removal of free oxygen from the gas samples to reoxidize Cu to CuO for more than one or two analyses after the combustible gas has disappeared from the products of combustion, and the increase in the length of the lighter areas which record combustible gases on the chart resulting from the absorption of oxygen from the flue gases is therefore negligible. The copper probably has more of a catalytic action, and incidentally forms a reserve supply of oxygen to draw on in emergency only.

What is of prime importance is the **immediate detection** and **recording** of combustible gases the instant they appear, and an accurate record of the CO_2 present at that particular time, and at all other times as well. The slight lag which might appear at rare intervals in recording the time when combustible gases **cease to appear** does not matter.

The CO_2 records of the machine are invariably accurate. This makes possible the accurate determination of the critical point at any time under any conditions. The critical point, C, as mentioned before, is the highest percentage of CO_2 that can be reached in a given furnace without having combustible gases begin to appear. The higher it can be raised, the more economical is the process of combustion. Knowing its maximum from the clear and accurate records of the instrument, the fireman can always tell the degree to which he is approaching ideal conditions. Should combustible gases appear at a point below the critical point, he knows that his dampers, fire doors, or the fire itself needs immediate attention, which experience soon teaches him to give to the best advantage.

The plant executive is given a permanent record which gives him the data necessary to compute the degree of efficiency attained in the firing of the furnaces, and offers him every opportunity to intelligently appreciate the efforts of the firemen. It enables him to give valuable suggestions and advice and to co-operate with the boiler room force most effectively towards promoting fuel economy.

WELL! WELL!

Willie—"Mother, my Sunday school teacher never takes a bath."

Mother—"Why, Willie, who told you that?"

Willie—"She did. She said she never did anything in private that she wouldn't do in public."

EXPORTS OF PULP AND PAPER ENCOURAGING

Canadian exports of pulp and paper for March were valued at $10,672,332, compared with $12,407,476 in March, 1921 and with $8,049,207 the preceding month of February, a decline of $1,735,144 from last year and a gain of $4,358,268 over February. In total volume, both pulp and paper show a substantial gain. Exports of newsprint paper amounted to 1,903,913 cwts. an increase of 388,445 compared with March a year ago, and constituted a new record. Pulp exports increased amounting to 586,138 cwts. and the value increase to $692,571. They weree made up as follows:

March	1921		1922	
Paper	Cwts	Value	Cwts	Value
Newsprint	1,515,468	$9,162,330	1,903,913	$6,793,128
Book	4,620	56,187	86	1,114
Other paper . . .		667,096		663,656
Total		$9,885,613		$7,457,898
Pulp —				
Sulphate (Kraft)..	139,173	$ 596,756	288,306	$ 902,254
Sulphite, bl. . . .	157,333	1,005,260	196,846	920,790
Sulphite, unb. . . .	152,913	635,755	299,767	828,453
Mech	139,868	284,092	390,506	562,937
Total . . .	589,287	$2,521,863	1,175,425	$3,214,434

The principal countries of destination were:

United	Paper	Pulp	Total
United Kingdom.	$ 329,165	$ 96,711	$ 425,876
United States . .	6,407,838	2,812,477	9,220,315
All other . . .	720,895	305,246	1,023,141

Comparative figures for the twelve months ending March 31st, the Canadian fiscal year, show the total value of all pulp and paper exported during the year as $105,458,295, which is $58,197,049 below 1921, the banner year, but $821,394 above 1920, the next highest. They compare as follows:

	Paper	Pulp	Total
1922	69,533,418	35,924,877	105,458,295
1921	92,103,307	71,552,037	163,655,344
1920	63,253,419	41,383,482	104,636,901

March shipments of pulpwood to the United States amounted to 96,998 cords, valued at $955,983, as against 589,287 cords, valued at $2,521,863 in March, 1921. For the year, wood exports totaled 825,967 cords, valued at $9,879,150. In 1921, 1,615,467 cords, valued at $21,513,594, were exported, and in 1920, 838,732 cords, valued at $8,454,803.

BIRD MACHINE COMPANY CONTRIBUTES TO THE VOCATIONAL EDUCATION FUND

One of the earliest contributors to the Vocational Education Fund was the Bird Machine Company, South Walpole, Mass. A letter received by the Vocational Education Committee last week carried an additional check, together with the following statement:

"Enclosed is our check for fifty dollars which we send cheerfully, knowing that it will be well spent".

Co-operation of this kind is especially helpful to the Committee is raising the necessary funds for the completion of the set of textbooks, the first three volumes of which have already received favorable mention in every quarter. A number of other concerns, indirectly connected with the pulp and paper industry have made generous contributions to the cost of preparing these textbooks.

European Doings

The Speculative Craze in Germany

On April 19, the price of news print reached 12.50 marks per kilo., or approximately 12,500 marks (about $40) a ton. Few people besides those who live in Germany can realise what this means. Briefly it means a bitter struggle between three parties; first, those who favor a prohibition of exports in the hope of lowering prices, and secondly, those who argue that exports of news print are vital, since it is one of the chief commodities which Germany can exchange for food. The trade journals view the problem in their own way, but, as a rule, they lean to the manufacturers' side. There is also a small party which would pass a law displacing the middleman and compelling the mills to sell direct to the consumer. This three-cornered quarrel has inspired some very lively propaganda.

Only insiders know the value of the reports which, from time to time, appear in the trade journals—that the market is dull, that production is falling off, while consumption and, of course, demand far exceed the supply, and strangest of all, that, after satisfying home requirements, there is a certain quantity of paper for export. At present there seems to be no precise way of describing the market: some call it active—which it certainly is in a speculative sense—and some call it dull, not knowing how else to qualify a market so patently a snare that nobody knows what he will have to pay when his goods are delivered. That there are very active speculative dealings is obvious to all who are given any inside information. The writer was informed that in the case of news print, sales amounting to millions of marks are not unusual as a day's turn-over by a large wholesale house in Frankfurt alone. It is doubtful, however, whether these sales are wholly for consumers' account; they have the air of being purely speculative, and are not unlike dealings in stock certificates "when issued", the news print, the medium of this speculation, not having left the mill, and possibly being not yet in existence. Speculation of this kind is now a craze, which has its most acute attacks when a sudden rise in the value of the dollar, and a corresponding depreciation of the mark, take place.

These fluctuations in the rate of exchange are the cause of a business demoralization which the better class of German merchants deplore in unmeasured terms. The audacious breach of contracts is one of its worst features. A manufacturer, for instance, who may have entered into an agreement to deliver news print when the mark was 200 to the dollar, not seldom cancels the contract, or demands a much higher price when the mark sinks to 300 to the dollar. In the latter case he will demand exactly 100 marks more than he did under the original terms of his "contract".

At present the price of news print is governed by a Syndicate which, as mentioned before, imposes an additional burden on the consumer and exporter, under the specious plea that materials are dearer, but the real reason is the steady rise in the dollar. Some merchants and manufacturers actually state in private that they ought to be paid in dollars, asserting that news print has an intrinsic value while the mark has none. As one manufacturer expressed it: "We are approaching Austrian or Russian conditions, and we cannot, or ought not, to exchange news print for anything but gold." The consequence is, if current reports be true, that there will soon be very little business in news print with the outside world, which hitherto has not come around to the belief in its intrinsic value.

Finnish Turpentine

Professor Ossian Aschan in his recent investigations of the sulphate process has made another important contribution to the industrial development of Finland. The output of turpentine as a by-product of cellulose mills has now reached very considerable figures—about 1,600,000 litres a year. Unlike the American, Spanish and French turpentine, the Finnish variety is from the chemical standpoint, not of simple composition. The former consists of from 5 to 10 per cent of pinenes which are the most valuable of all known terpenes with the common formula $C_{10}H_{16}$. Purified turpentine consists of pinenes which are used in the preparation of terpene hydrate and synthetic camphor, which constitutes a world industry. The technical and commercial value of Finnish turpentine may be judged from the large proportion of pinenes which it contains and which amounts to 5 per cent, while the other half consists of a mixture of two other terpenes, dipentene and sylvestrend. Distillation showed that it yielded fractions capable of extensive technical applications. — Papers-Travarvoch och Industritifskrift for Finland.

Exports of German Print Papers

Despite the virtual certainty that many newspapers will have to suspend, exports of German print papers are increasing. According to figures just published the United States have taken the greater quantities—in cwt.

	1921		1922
	Nov.	Dec.	Jan.
France	59,76	7,716	9,786
Italy	9,083	11,833	11,561
Holland	5,477	7,661	9,046
South America	32,949	13,732	22,078
United States	24,282	23,851	37,423
Other countries	20,060	25,772	26,571
Total cwt.	97,797	90,565	116,465
Value in 1000 mk.	67,076	78,950	104,261

WHO PAYS FOR ACCIDENTS?

The workman who takes a chance or breaks a safety rule and is permanently injured sustains a loss that cannot be measured in dollars, for a hand, an arm, or eyesight lost is gone beyond replacement, says "Factory Magazine". Every accident is a direct waste or loss and must be paid for by someone. While you may receive a certain amount of dollars for your injury, there is no amount that can compensate you for being permanently disabled. Even though your injury be less severe, it often permanently reduces your earning power, and puts a burden on your family. A decreased income may cause your wife much suffering and deny your children the opportunity of an education. The dollar bags are only symbolical, and your loss would have been more clearly shown could we have placed in the balance the lost eye, hands, arms, or legs, lower earning capacity and fewer comforts and advantages to your family.

There is but one thing that will eliminate your loss and that is personal caution at all times. Don't blame anyone else, for the remedy is in your own hands.

British Trade News

(From our London Correspondent)

London. April 18, 1922.—An old favorite of pre-war days has again made its appearance—the International Building Trades Exhibition. Previous to the outbreak of war the Exhibition was held every other year, but since its revival it will again become a biennial event. As side shows, wall-papers and boards attract much attention. The Thames Paper Co., Ltd., are making a speciality of their "Sx" board for interior lining of ceilings and walls. It is said to be notable for rigidity and high tensile strength and is easily and rapidly fitted. Another claim for the board is that it cannot crack or fall, and is made to take distemper, varnish, enamel, etc., without any special treatment. I mention these few points for Canadian board-makers.

Sir F. Becker "Interrogated"

It is rumored that someone has been trying to interrogate Sir Frederick Becker on his return to England from Canada. Those who know the Canadian pulp pioneer in London can realise the task it is to interrogate him. "I have only fixed up a contract," he said, "with Chicoutimi, which represents between £14,000,000 and £15,000,000." A £1,000,000 is not much in London—but the humor for the interrogator lies in the difference between the fourteen and fifteen millions. And then the interrogated told the interrogator that all the talk about big deals and big schemes in Canada was "moonshine." Indeed, Sir Frederick thinks that some of the writers in the land of the Maple Leaf "give vent to vivid imaginations." Of course, it is Sir Fred's "Blarney" — with an "interrogator." Still we have to be thankful for small mercies in these days of pulp and paper depression and it is very gratifying to know that we have a man like Sir Frederick taking an interest in Canadian industry and upholding the post-war slogan, "Trade within the Empire." It would be a happy day for the Colonies and Dominions if London had about three score Fred. Beckers. Sir Frederick has done a lot for Canadian pulp, is still doing "his bit"—but no "interrogator" will ever find out the extent of his ingenuity, energy, and foresight on matters of pulp buying and selling.

Board Men Combine

The Paper Makers' Association, since its inception with North and South, is gradually following in the trail of the Canadian and American Association. The latest offspring takes the form of a Box-Board Section, but only members with multi-cylinder mould machines are entitled to become associated with the Section. This new Section will very likely co-operate with the Paper Box Makers. It is a move in the right direction and it should be interesting to read an annual report issued by the joint bodies.

Statistics

Preliminary figures relating to March imports and exports have been issued. Fuller details will appear in my next despatch. I find in March pulp was imported to the extent of 28,886 tons, compared with 25,994 tons in 1921 and 64,798 tons in March 1920.

Paper imports reached 984,052 cwts, which excels March 1921 and 1920.

British exports of paper and cardboard were about 137,935 cwts. compared with 109,551 cwts in 1921 and 163,773 cwts in March 1920.

Swedish Peace

Messages have reached London that peace agreements have been reached in Sweden. I mentioned some weeks ago that labor troubles were hampering the paper mills and the production of paper. It is now stated that the new agreement will last until February 1923 and there will be an immediate reduction in wages to be followed by another on Sept. 1.

Dickinson's Additional Dividend

John Dickinson & Co. Ltd., have declared an additional interim dividend of 5 p.c. on their ordinary shares in respect of the year ended December 31, 1921. This will probably conclude the payment of a dividend for last year. Dickinsons' have a big connection with Australia and the preference for British paper should greatly enhance the value of their exports. According to messages reaching London the demand and competition for fine papers in the Antipodes are keen. British sellers, in order to capture what is going, are quoting low prices.

The Wages Conference

I mentioned last week that the Employers' Federation of the Paper Makers, and the Men's Unions, were holding a secret conference on the long drawn out wages and hours questions. At this conference the employers submitted certain terms and the Unions are discussing them this week. As the present agreement expires on May 4, the parties in the conference will have to expedite their business. The scheme submitted now to the Unions should be the final one and, if they accept, we may hear no more about unrest; if they do not an awkward position arises in view of the national agreement ending on May 4. There seems, however, considerable slowness in arriving at a decision. This slowness, I am informed, is attributable to the stubborn ways adopted by the workers' representatives. They know they have got to lose something and they are "hanging out" for all they can get. On the other hand the hours worked are not satisfactory to the mill-owners. Not so long ago Sir Frederick Becker said if they could induce the hands to work longer hours the mills would do better. The workers' case is, if they work longer hours they are reducing employment and their finances cannot stand more unemployment — their idea being to make the work go round and cover as many workers as possible.

Fibre Containers

In view of the pilfering that is carried on while goods are in transit on Canadian and English railroads, and passing through docks, wooden cases are on trial. The London Chamber of Commerce reports on the subject and reference is made to the fiberite box made by the Thames Paper Co., Ltd. These boxes are made with wooden frame ends and once a thief opens them they fall to pieces. In other words he cannot get at the contents without destroying the whole box. These boxes are made for inland and cross-channel traffic, but the Chamber of Commerce do not think they will be suitable for, say, Atlantic voyages. To further protect the fiberite boxes against pilfering they are strapped with the Signode system and carry weights equal to 56 lb. and 84 lb. The Chamber has also inspected cardboard boxes exhibited by the Alliance Box Co. These are fixed with wire staples or with bifurcated rivets and they are reported on as being suitable, as well as affording protection against thieves, for certain kinds of goods transported on the railroads. The fibre box, or container, seems to be most favored.

PULP AND PAPER NEWS

The Hodge Sheriff Paper Co. of Toronto has found it necessary on account of expanding business to secure more commodious quarters. These have been secured on the first floor of the McKinnon Building in which they now have offices on the third floor. Their address will, therefore, be unchanged.

Mr. I. H. Weldon, president of the Provincial Paper Mills, Limited, spent a few days in Montreal last week.

The offices of the Eastern Pulp Company, Limited, and of J. H. A. Acer and Company, Limited, have been removed from the Sun Life Building to the Canada Cement Building, Montreal.

Canadian Mead-Morrison Company, Ltd., manufacturers of wood room equipment, coal and ore handling machinery, hoisting and conveying machinery and labor saving plants have moved their general sales office from 285 Beaver Hall Hill to the Canada Cement Building, Phillips Square, Montreal.

Messrs. A. Klipstein & Company Ltd., 12 St. Peter St., Montreal, are again selling Aluminum Sulphate for the paper making industry. The manufacturing works are located near Albany, N. Y. which gives a decided freight advantage to Canadian points.

Mr. D. A. Pritchard, until recently Electrochemical Superintendent of the United Alkali Company in England, has been appointed Works Manager of the Canadian Salt Co., Windsor, Ont. Mr. Pritchard recently arrived from England, and assumed his new duties. It is the intention of this Company to proceed immediately with the installation of a plant for liquifying Chlorine gas with a capacity of approximately ten tons per day.

PRICE BROS' YEAR

Profits of $1,327,332 are shown by Price Brothers & Company, Limited, in the annual report covering the fiscal year ended February 28, 1922. The report reflects the labor troubles as well as the unfavorable market for its products during the greater part of the period under review, and closed the year with a deficit of $161,620 after bond interest and dividends, but before depreciation and Government taxes. The previous report covered a fiscal period of only four months, so comparisons must be made as between the full year and the four months. Figures for the latter period are valuable in that they give some idea as to the earning capacity of the company under favorable trade conditions. In his remarks to shareholders, Sir William Price, President of the company, says: "There has been a decided falling-off in inventory values, and your directors have felt it incumbent upon them to write all these down to replacement values, or less, but in doing this they have found themselves unable to make any provision for ordinary depreciation of fixed assets or depletion of limits. This year under review covers a period during which the company suffered from labor troubles at its paper mills. The loss thus entailed by reduction in output, coupled with the shrinkage on account of falling prices in newsprint, is reflected in the company's earnings. The year under review has been a very bad one for the lumber business and this shrinkage in revenue. Your directors being alive to the fact that the general depression was likely to last for some time, immediately set about making all possible internal economies, and feel that with their inventories brought forward at values, as explained above, the company is in a proper shape to face the present depression until such time as conditions improve."

A. M. HUESTIS RETURNS FROM EUROPE

The Pulp and Paper Magazine had a chat with Mr. Huestis who has just returned to Toronto from a trip to Europe covering several months and including the principal centres.

He noted unemployment conditions particularly, finding that of the industrial nations Great Britain was worst off in this respect. There were few unemployed in France and Belgium, and almost none in Germany.

A very large news print mill is under way for Lyons, France. Swedish kraft mills and German coated paper mills were very busy.

Mr. Huestis has opened an office at No. 8 Colborne St., Toronto and in addition to the lines he formerly handled acting as representative of the Kalbfleisch Corporation, he will carry several other lines of papermakers' chemicals including new lines of British made ultramarines and glues.

SHIPMENTS INCREASE, STOCKS DECREASE

Mr. R. S. Kellogg, Secretary of the News Print Service Bureau, New York, has issued the following interesting statistical review of the newsprint business.

First Quarter 1922

Production, shipments and stocks for the first three months of 1922 compared with the same period in 1921 as follows:

Production — 3 Months

	Tons 1922	Tons 1921	% Increase
Canada	245,685	200,744	22
U. S.	321,101	334,402	(a) 4
Total	566,786	535,146	6

(a) Decrease

Shipments — 3 Months

	1922 Tons	1921 Tons	Increase %
Canada	251,603	193,120	30
U. S.	316,855	317,376	
Total	568,458	510,496	11

Mill Stocks on March 31

	1922 Tons	1921 Tons	Increase %
Canada	7,919	18,663	58
U. S.	28,180	41,789	32
Total	36,099	60,452	40

Technical Section

REVIEW OF RECENT LITERATURE

A-3 Exotic Gramineous Plants as Raw Materials for Paper Making. CH. GROUD. **Papeterie,** xliii, 733-734, (Aug. 25, 1921). A very brief sketch of the paper making qualities of various African, Asiatic, and American grasses. -A. P. -C.

A-5; G-12 Groundwood Preservation Tests. JOHN S. BATES. **Pulp and Paper,** xix, 851-853, (Aug. 18, 1921). Description of large-scale experiments carried out on groundwood laps at the Kenogami mill of Price Bros. & Co., Ltd. The treatments were designed to give one light and one heavy treatment with each preservative tried, the former representing moderate cost and possible value in retarding decay, and the latter representing high cost but certain preservation from decay if the substance is any good for the purpose. The proportions (by weight) of preservatives used to air-dry pulp treated were: zinc chloride 1.11 per cent. and 3.61 per cent; mercuric chloride 0.057 and 0.187 per cent; sodium fluoride 0.581 and 2.90 per cent. A solution of suitable strength of the preservative was sprayed on to a felt roll fitted to the top press roll of an ordinary groundwood wet machine. Treated and untreated laps were kept in storage for over 18 months. At the end of this time there were pronounced black spots in the zinc chloride treated laps and dark grey patches in those treated with mercuric chloride; while the sodium fluoride treated laps were all in excellent condition, the only change being a certain amount of pale grey discoloration as ordinarily found in storage pulp. In each case the untreated laps followed the treated laps to some extent; but they showed less black discoloration and more rot of the ordinary varieties, although deterioration was not serious after nearly two years in storage. Laps were then kept in a most brick kiln where molds and fungi could develop at a faster rate. After eighteen months storage the laps from the light and heavy zinc chloride treatments were badly discolored by characteristic black spots which were caused by clusters of brown fungus filaments, so that the peculiar fungus discoloration was apparently stimulated by the presence of zinc chloride. The laps from the light and heavy mercuric chloride treatments were also badly discolored, having a speckled appearance, mainly on the surface, due to characteristic green and grey patches of the mold, probably **Penicillium,** which causes the ordinary molding of bread. The laps from the light and heavy sodium fluoride treatments in most cases looked the same as when they were put into the kiln. In the lower portions of the piles, where no drying had taken place, there were a few pale grey patches which were not due to fungus or molds, but was probably an iron tannate stain. From the tests it appears that sodium fluoride is a promising preservative for groundwood pulp. Under the varied conditions of testing it preserved the original color and quality of the pulp satisfactorily. The lighter treatment was sufficient and comparatively inexpensive. Further experiments would be necessary to establish the exact proportions of chemical necessary, the cost of treatment on a commercial scale, and the effectiveness in retarding decay under all conditions of storage. -A. P. -C.

A-14 Identification of Loading Materials in Paper. Industsria della Carta; Papeterie, xliii, 549-550, (June 25, 1921). Outline of the chemical tests to be used for detecting the various loading materials used in paper making, and also of their characteristic microscopic appearance. -A. P. -C.

B-2 Indigenous (French) Raw Materials for Paper Making. CH. GROUD. **Papeterie,** xliii, 588, 591, (July 10, 1921); 682-684, (Aug. 10, 1921). Discussion of the advisability of reforestation with poplar and conifers, rather than with hardwoods such as oak, of intensifying reforestation in France, and of utilizing plants such as broom, vine shoots, and the straws of various gramineous plants. -A. P. -C.

B-4 Making Pulp from Pine Stumps and Logging Refuse. Paper, xxix, 11-13, (Sept. 7, 1921). During the last 15 years Joseph H. Wallace & Co. have been working on the utilization of pine stumps and logging refuse. They have succeeded in evolving a satisfactory process. The preliminary treatment will take place in a small semi-portable field plant of a very simple design, operating at a central point in the land clearing scheme and producing turpentine, pine-oil, rosin, pyroligneous acid, and tar, as well as a main product, pulp chip of uniform moisture and resin content. The crude products will then be transported to centrally located plants and existing mills where the manufacture of pulp and paper and the refining operations are carried out. The material unsuitable for pulp manufacture (termed "trash") will be used as a raw material for destructive distillation, producing, in addition to the usual acid, flotation oil, etc., a fuel supply sufficient for all the requirements of the field plant. The process has been thoroughly demonstrated in a semi-commercial plant at Stamford, Conn. -A. P. -C.

B-6 Motor Hauling Cuts Wood Operating Costs. Pulp and Paper, xix, 872, (Aug. 18, 1921). Figures recently presented to the Woodlands Section of the American Paper and Pulp Association show that the use of power equipment cuts the cost of log hauling as much as 70 per cent. -A. P. -C.

B-7 Private Forestry. J. K. JOHNSON, Great Southern Lumber Co. **Paper,** xxviii, 9-10, 39, (Aug. 24, 1921). A plea in favor of the extension of private forestry on the ground that "it costs too much not to practice forestry", together with a sketch of the work being carried out by the Great Southern Lumber Co. for the proper utilization of forest products and the reduction of waste to a minimum. -A. P.-C.

B-9 The Paper Industry and the Pulpwood Supply. R. S. KELLOGG, Secretary of the News Print Service Bureau. **Pulp and Paper,** xix, 881-882, (Aug. 25, 1921). See this journal, xix, 866, B-4, Aug. 18, 1921. -A. P. -C.

N-4 The Care of Steam Boilers During Shut-Downs. Papeterie, xliii, 738, (Aug. 25, 1921). To prevent rusting, boilers should be either emptied out completely and cleaned, keeping them as dry as possible, or else they should be filled with water in which is dissolved 0.5 to 1 kilo of sodium or potassium bichromate and an equal amount of soda ash. -A. P. -C.

D-3, E-3, F-3, R-6. Reducing the Waste of Pulp Wood. More Pulp per Cord. JOHN D. RUE, In charge, Pulp and Paper Section, Forest Products, Lab., Madison, Wis. **Chem. Met Eng.,** xxv, 447-448, (Aug. 31, 1921). A brief discussion of the various causes which prevent the most complete utilization of wood in the manufacture of pulp, with hints as to the lines along which research should be conducted to eliminate this waste, at least in part: reducing the decay of pulp wood during storage, controlling grinding operations, improving methods of pulp manufacture, utilization of hardwoods and pines. -A. P.-C.

E-0 The Manufacture of Paper Pulp by Means of Chlorine. UMBERTO POMILIO. **Chimie et Industrie, 6,** 267-275, (Sept. 1921). Translation by A. Papineau-Couture in **Pulp and Paper**, xix, 1255-1259, (Dec. 15, 1921). Also, abridged translation in **Paper**, xxix 27-29, (Nov. 9, 1921). Paper pulp can be prepared from vegetable materials by treatment with caustic soda, bisulphites, or oxidizing agents and then alkali. The last is the most efficient, and is used in the laboratory for the determination of cellulose; but it has not been extensively applied commercially on account of its high cost. In 1916 an Italian firm built a mill to make pulp according to the Cataldi patent (Fr. 492,222, Sept. 9, 1916. See **Pulp and Paper**, xviii, 301, F-5, March 18, 1920.). It has now been in operation for 4 years, and has shown that theoretical yields can be obtained on a commercial scale, and that the quality of the pulp is superior to that of soda pulp. The "Elettrochimica Pomolo" is erecting a 10 t. mill to prepare hemp pulp by this process. Its advantages are simplicity, ease of control, low consumption of chemicals and raw materials, reduced labor, low power consumption, simple and compact equipment, and high yield. It also furnishes a ready market for surplus chlorine production. -A. P. -C.

F-5 The Cooking of Plants for the Preparation of Paper Pulp: Pressure vs. Atmospheric Cooking. RAYMOND FOURNIER. **Papier,** xxiv, 404-410, (Sept. 1921). Under no conditions does treatment with alkaline liquor alone give a pure cellulose; its action must be completed by an oxidizing treatment (known as bleaching). Cooking under high pressures has few advantages and many drawbacks. Results are given of tests carried out on wheat straw, reeds, papyrus, and esparto, comparing cooking under high pressure and without pressure under varying conditions. Fournier concludes that the use of pressure alone presents no great advantage and it should be supplemented by a mechanical treatment which allows of more intimate contact of the liquor with the material. When this was done and sufficient caustic was used, the incrustants were solubilized in a fairly short time; but continuing the treatment for a long period (up to 700 per cent) did not appreciably lower the yield, showing that the cellulose was not attacked. The use of a large excess of caustic soda does not greatly lower the yield. -A. P. -C.

K-6 Pulping Methods for Bamboos and Grasses. R.W. SINDALL. **Paper.** xxviii, 15-16, (Aug. 31, 1921). Description of the method of chipping bamboo, cooking esparto and bamboo, and reclaiming by-prductss from the waste liquors according to the Rinman method, which is to be carried out at a plant which is being installed in Scotland. The mill is being erected in view of the treatment of esparto and "its application to bamboo is stated to be merely a matter of adaptation". -A. P. -C.

K-10 Rosin Sizing. Papeterie, xliii, 742-746, (Aug. 25, 1921). Practical directions as to the preparation and application of rosin size, addition of alum, and treatment of hard water. -A. P. -C.

K-12 Paper Making Wires. V. BOUYER. **Papeterie,** xliii, 773-778, (Sept. 10, 1921); 818-826, (Sept. 25, 1921); 866-881, (Oct. 10, 1921). A detailed description of the different weaves of wire cloth used on paper machines, of the kind of work best suited to the various kinds of wires, and of the causes of deterioration. -A.-P. -C.

K-12 The Fastest Paper Machine in the World. Paper, xxviii, 16-18, 33, (Aug. 3, 1921). Brief description of some of the features of the 1200 ft. a min. news print machine built by the Beloit Iron Works and installed at the Wisconsin Rapids mill of the Consolidated Water Power and Paper Co.: temperature control of the driers, discharge of the condensate from the drip headers, evacuation of entrapped air from the driers, reclamation of heat units, lubrication of bearings, automatic paper feed through the machine, and speed control. -A. P. -C.

K-0 Old Watermarks of Animals. DARD HUNTER. **Paper,** xxviii, 12-15, 25, (Aug. 24, 1921). Historical sketch of the use of watermarks. -A. P. -C.

N-5 The Use of Powdered Fuel. HARLOW D. SAVAGE, Combustion Engineering Corp., New York. **Paper**, xxviii, Nos. 23, 24, 25, 26, (Aug. 10, 17, 24, 31, 1921). A very brief mention of the preparation plant necessary in connection with powdered fuel installations, together with a digest of the work that has been done in the last three years in the equipping of steam power plants with powdered coal, a record of the progress that has been made in rendering powdered coal for steam production thoroughly reliable and efficient and a presentation of the economic possibilities of this most efficient method of combustion. The data given are taken entirely from plants with which the writer has had active pressonal contact. -A. P -C.

N-0 R-6 Elimination of Waste in Industrial Power Plants. DAVID MOFFAT MYERS, New York City. **Chem. Met. Eng.**, xxv, 413-416, (Aug, 31, 1921). The determining factor in deciding whether an industry should own its power plant or buy its power is the relation of heating and process steam to power demand. -A. P. -C.

M-4 Steel Belt Power Transmission. Pulp and Paper. xix, 929-930, (Sept. 8, 1921). Early efforts at introducing belts failed because the fact had been overlooked that a tension constantly varying from zero to a maximum and frequently applied to a body causes self-destruction if the maximum tension is not confined to half the breaking stress of the material. A satisfactory system of steel belts is now on the markets. Its merits are dwelt upon at some length. -A. P. -C.

P-2; R-6 Reduction of Waste through Accident Prevention. L. A. DeBLOIS, Manager, Safety Section, E. I. DuPont de Nemours & Co., Wilmington, Del. **Chem. Met. Eng.**, xxv, 403-406, (Aug. 31, 1921). The chemical industry in many of its branches is in the development or quasi-development stage in the U. S. It is therefore important that its industrial accidents should be carefully analyzed. -A. P. -C.

R-1 The Paper Industry of Austria. JOHN F. SIMONS, Vienna. **Paper,** xxviii, 15, 32, (Aug. 3, 1921). An analysis of the present status of the Austrian paper industry. -A. P. -C.

R-1 The Warkaus Mills of Finland. SULPHO SETALA. **Paper,** xxviii, 11-14, (Aug. 10, 1921). Description of the Warkaus Works, comprising groundwood mill, sulphite mill, saw mill, and paper mill. -A. P. -C.

R-4 Salesmanship. B. SPROULE. **Pulp and Paper,** xix, 901-902, (Sept. 1, 1921). A discussion of proper salesmanship methods, more particularly from the point of view of the paper box manufacturer. -A. P. -C.

R-4; R-6 The Elimination of Waste in Marketing. WILLIAM R. BASSETT, Miller Franklin & Bassett Co., New York City. **Chem. Met. Eng.**, xxv, 420-422, (Aug. 1, 1921). Marketing from the point of view of the manufacturer can be made more profitable by the application of better methods of distribution and by the establishment of improved selling policies. A. P.-C.

CANADIAN TRADE CONDITIONS

Montreal, May 2. — Newsprint continues to command the chief attention in the pulp and paper markets. There are many inquiries for spot business, inquiries which necessarily do not meet with any ready response. Canadian mills are filled with orders for a long period ahead, and those American publishers who have been relying on European stocks or who have allowed their supplies to run down, are now very anxious to cover themselves against contingencies. The trouble with the American paper mills has been postponed, but the coal strike is bound to have an increasingly acute effect on the paper and other trades. Under the pressure of this greater demand, there is reason to believe that the price of newsprint will advance. The Canadian mills are not responsible for the reduction in the price — that was forced upon them, and now that the demand has grown, an upward movement in values would not be a matter for surprise, especially as manufacturing costs are still high, especially in the case of mills with substantial stocks of wood bought at or near the peak.

Apart altogether from such abnormal circumstances as the threatened strike of paper mill operatives and the coal trouble, which caused a certain number of orders to come to Canada, there is an undoubted rise in the consumption of newsprint. This is likely to continue, making for a favorable outlook for the immediate future.

Fine and book papers are in fair demand, while tissues and toilets have a good market. Wrappings are in satisfactory request, but boards are still quiet. In another part of this issue we print an article calling attention to the menace to our book paper trade by the agitation on the part of the publishers to obtain a removal of the duty. Agitation of this character, renewed as it is, creates a feeling of uncertainty on the part of our manufacturers, who naturally will hesitate to expand their facilities if the tariff is lowered or removed. This will mean loss of business to the construction, engineering, and other branches of commerce —in fact an all round loss to Canada and a corresponding benefit to competitors in the United States.

Several inquiries for fine, book, and writing papers for abroad have been received, and there is a good chance of some of the business coming to Canada. Competition, however, is of the most acute description, British manufacturers being particularly keen to secure orders.

The pulp department shows little variation. Groundwood is very slow of sale, and the prospects of either a betterment in price or of larger orders are not very encouraging. Chemical pulps are in moderate request, with a little more demand for bleached sulphite at the recent cut in quotations.

Toronto Topics

May Day in business here looks back over the signs of spring in trade and wonders why revival hangs fire when so many signs point the way. Even the marked reaction in stocks last week is regarded as a healthy sign.

The most definitely cheering contribution to the list of factors for betterment is that throughout the Province and in Toronto itself there is improved building activity. In most branches of buiding there is more activity than has been known since 1914.

No line of pulp and paper activity shows any marked improvement. One or two have been somewhat quieter. Writings have slowed down somewhat from their recent activity, for example, but as no especial cause can be assigned the only surmise is that buying is not yet resumed and dealers were making up stocks in anticipation of sales that did not develop in volume This is one example of several similar experiences. It indicates that heavy stocks are not being carried and with any strong resumption of buying on the part of consumers there should be a rapid absorption of stocks in hand.

It is the general opinion here that common sense will prevent a strike materializing after the expiration of the fifteen days **statu quo** agreement. It is thought that as far as Canadian mills are concerned both sides are anxious to avoid a strike.

The pulp market lacks any strong feature, mills operating about 75 p.c. of capacity. Prices are more or less nominal. Following are approximate delivered prices which are fairly uniform.

GROUNDWOOD. — News grade around $30 delivered. Book grade around $37 delivered.

SULPHITE. — News grades around $65 delivered. Book grades around $70 delivered. Bleached grades around $90 delivered.

SULPHATE. — Delivered $70.

BOOK AND WRITING. — Fair business is being done in a quiet way, but there is no indication that trade is taking any more than immediate needs.

BRISTOLS, COVERS, TAGS. — Market varies from dull to fair activity within periods of a few days at a time. Last week was dull. This week there was a brightening in all lines, but appearances do not indicate any settled improvement.

WRAPPINGS. — No. 1 Kraft 8 3-4c. per lb. Colored Kraft 9 1-4c. to 10 1-4c. per lb. Manilla 5 1-4c. to 7 1-2 c. per lb.

BAGS. — Manilla 60,20 p.c. off regular list prices. Light Kraft 60,20, 2 1-2 per cent. Heavy Kraft 70,10 per cent. White Bond, 45,10, 10 per cent.

TISSUES.—

Manilla	20 x 30	$ .80	24 x 36	$1.05 Rm.
Nat. White . .	20 x 30	.90	24 x 36	1.25 Rm.
No. 1 White . .	20 x 30	1.10	24 x 36	1.55 Rm.
White Sulphite	20 x 30	1.00	24 x 36	1.40 Rm.

TOWELS. — Interfolding $5.63 per case. Rolls of 150 towels, 50 Rolls to case:—

Bleached white	$22.10 per case less 22 p.c.
Natural	19.00 per case less 22 p.c.
No. 3 Towels	13.75 per case less 22 p.c.

PAPER STOCK—

No. 1 Hard White Shavings	$3.75
No. 1 Soft White Shavings	3.25
No. 1 Heavy Books & Magazines . . .	1.50
Ledgers and Writings	1.80
No. 1 Kraft	2.25
Newspapers	.90
No. 1 Mixed Papers	.60
Miscellaneous Mixed Papers	.55

Cotton Rags No. 1	4.25 4.50
Thirds and Blues (repacked)	1.50—1.75
Roofing Rags	.95—1.00
New Cotton Cuttings	No quotations.
No. 1 White Shirt Cuttings	9c. to 10c. per lb.
Canton Flannels Bleached	7½c. per lb.
Fancy Shirt Cuttings	4½c. per lb.
White Lawns	7 c. per lb.
Blue Overall Cuttings	5 c. per lb.

ROPES & BAGGING.

No. 1 Scrap Bagging, $17.50 per ton. Not moving very quickly.

No. 1 Manila Rope,4½c. per lb. In good demand.

Mixed Strings,$20.00 per ton. In fair demand.

There have been no new developments in the Waste Paper market since last week. All grades are comparatively quiet, the demand being very spotty. The paper and board manufacturers have come into the market as buyers only in spasmodic fashion, generally confining orders to immediate needs.

There seems to be a slightly firmer undertone in the higher grades as the packers are not so willing to meet buyers' demands on grades that can be stored for comparatively little trouble.

There are no fresh developments in old Cotton Rags. Some of the American Felt manufacturers came into the market for small tonnages, but they have only been felt at certain points where the orders have been placed. Generally speaking the other grades are full except for sales of odd lots. New Cotton Cuttings continue in a nominal position. No. 1 White Shirt Cuttings have sold at anywhere from 9 cents to 9½c. per lb. but orders for most grades are far apart.

NEW YORK MARKETS

New York, April 29—(Special Correspondence)—Activity of a consistent character is apparent in the paper trade, and the market is showing steady improvement. On nearly all sides are indications of increasing demand for paper of most kinds, and manufacturers and merchants with few exceptions express a great deal more satisfaction over the prevailing situation than that which has existed in many months. There seems to be positive proof that the paper industry is well on the road to normalcy and that the market is becoming better stabilized and healthier each day. Consumers are absorbing larger amounts of paper, and jobbers are at last commencing to lay in stocks; thus mills are acquiring more orders and are increasing their operations. Moreover, a highly encouraging feature of the present situation is that everything seems to point to a long period of good business; that the improvement of the past few weeks is not merely spasmodic, but that it will continue and that the paper market will gradually though steadily become livelier as well as healthier.

Latest statistics on newsprint are very favorable. The Federal Trade Commission's report of the U.S. print paper industry for March shows that production of newsprint increased very materially during that month, amounting to 117,507 net tons of total newsprint, compared with 97,786 tons produced in February. March output of this year was some 10,000 tons greater than the production of 107,532 tons in the same month a year ago, and compared quite favorably with the output of 127,847 in March, 1920, when paper mills were running at abnormally heavy capacity. Reports in the trade say that newsprint mills throughout the

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SOLE AGENTS IN U. S. A., CANADA, MEXICO AND CUBA FOR

Finnish Cellulose Association
Helsingfors, Finland

AND

Finnish Wood Pulp Union
Helsingfors, Finland

United States are operating at better than 85 per cent of full capacity, and that they are shipping out practically all their tonnage as quickly as it becomes available. This seems to be proven by the Federal Trade Commission's report which shows that in March mill stocks increased but slightly more than a thousand tons despite a jump in production over the preceding month of 20,000 tons. Further, the threat of another strike of newsprint mill workers on May 1 has been creative of a larger demand recently for print paper. Publishers, fearing that if the strike is declared they may be occasioned difficulty in obtaining supplies, have been actively in the market and have taken in all the paper found available.

There is a fairly steady demand for wrapping, tissue and fine papers. Writing papers are moving in steadily increasing volume and at firming prices, and there is little doubt that wrapping papers would advance were it not for the foreign competition which is just sufficient to hold the market down for domestic wrapping papers. Book papers are in an unfavorable position. Demand is nowhere near what it should be, yet there are numerous indications of better conditions ahead. Magazines and trade periodicals are increasing the size and number of their issues and this in due time will bring a return of activity for book paper. Prices are unsettled, and now and then some very low quotations are heard. Most manufacturers are obliged to sell machine finished book at no higher than 5.75 cents a pound f. o.b. consuming points, and super book is bringing only around 6 cents a pound.

Box boards are in comparatively good demand and are steady in price. There is an upward tendency to quotations, as would be expected when it is considered that manufacturers are working on an exceedingly narrow margin of profit, but no actual changes have yet been recorded. Around $35 a ton f. o.b. New York on plain chip board and $37.50 on news board are the prices commonly quoted, and one eastern mill is known to have booked orders recently at $32.50 on chip board.

GROUND WOOD— Available stocks of mechanical wood pulp are probably larger at present than in some time, yet quotations are fairly well maintained and the market is noticeably lacking selling pressure. Grinders have been plentifully supplied with water in recent weeks and therefore have increased their production but it would appear that few or none of them are pushing pulp onto the market and that they are conserving such output as they cannot find a ready market for now. Prices on domestic prime spruce ground wood range around an average of $32 a ton f. o.b. producing plants, with prices named $2 a ton on either side of this level, depending on the distance of the haul to consuming points. Delivered consuming mill quotations are from $37 to $40 a ton with very little variation from this range.

CHEMICAL PULP—Current trading in chemical wood pulp is mainly of routine character and while demand lacks the snap that is a feature in busier times it seems that enough pulp is being moved toward consumers to sustain values. The reduction in prices on domestic bleached sulphite is reported to have led to a little more buying, and No. 1 bleached is moving fairly freely at about 4.50 cents a pound at pulp mills. There is also a moderately good call for news grade sulphite at an average of 2.50 cents per pound, and for domestic kraft pulp at from 2.75 to 3 cents. Foreign bleached sulphite is quoted at around 4.25 cents ex dock New York for No. 1 bleached, easy bleaching at about 3 cents, Mitscherlich unbleached at 2.90 cents, and Scandinavian kraft at 2.65 to 2.75 cents.

RAGS—The market for papermaking rags is commencing to look up. Demand thus far is principally for small lots needed by mills for direct use but there are plenty of indications that consumption of rags is on the rise and that paper manufacturers are beginning to think about forward requirements. This, coupled with the fact that dealers and packers view the outlook with much confidence and are not pressing stocks onto the market at present, make for a firmer price undertone.

PAPER STOCK—Some grades of old paper display a strengthening price tendency. Soft white shavings are especially firm and dealers in New York mostly demand at least 3.15 cents a pound f. o. b. this city for No. 1 packing, with some refusing orders at less than 3.25 cents. Old books and magazines are firm at 1.35 to 1.40 cents per pound, and white blank news cuttings are hardly to be had at less than 1.65 cents. Folded newspapers continue to sell to board mills at about 55 cents a hundred pounds New York, and No. 1 mixed paper at 42½ to 45 cents. Hard white shavings are in rather slow demand and are quoted at 3.75 cents a pound, on an average, for No. 1 packing. Old kraft also is neglected by most consumers, with offered prices ranging around 1.70 cents.

OLD ROPE AND BAGGING—Old manila rope is meeting with routine demand from regular consuming sources and is selling to paper mills at 4.25 cents per pound f. o.b. dealers' shipping points for No. 1 rope. Mixed strings command 90 cents a hundred pounds New York, and are in fair call. No. 1 scrap bagging is bringing one cent a pound New York with some of the tissue paper mills paying up to 1.25 cents for specially graded and packed bagging.

Scandinavian American Trading Co.

50 E. 42nd STREET
NEW YORK

CHEMICAL
MECHANICAL
WOOD PULP
FOREIGN
DOMESTIC

UNITED STATES NOTES

Committees representing newsprint manufacturers and the paper makers' unions, following a series of conferences in the Murray Hill Hotel, New York City, last week, agreed to a two weeks' armistice in their wage controversy. The truce was proposed by the union delegates who said they wanted to submit to a referendum the proposal of the manufacturers that the scale of wages for unskilled labor be fixed according to the prevailing scale in the locality in which the men work. The existing agreement between the unions and the manufacturers expired May 1. Floyd L. Carlisle, chairman of the mill owners committee, said the mills would continue to operate under the terms of this agreement during the armistice. Although neither side would confirm the report, it is understood that the manufacturers have indicated their willingness to forego the proposed 10 per cent cut in the wages of skilled men if the unions will agree to place the unskilled men outside the agreement. Mr. Carlisle expressed the belief that if the men strike it will mean the death of unionism in the paper industry. He predicted that a strike would find the mills running within a week. There would be no imminent danger of a shortage of newsprint, he added. The several days' bickering has brought a decided advantage to the manufacturers. There is less talk of a strike, and the skilled unions are now considering working out their wage agreements alone, leaving the unskilled men to shift for themselves. The manufacturers' demand regarding unskilled labor has therefore become the most important matter under consideration. The present wage scale ranges from 55 cents to one dollar an hour, with time and a half for Sundays and holidays. The mills that would be involved if a strike came include practically all the leading companies with the exception of the International Paper Company, and they supply about fifty per cent. of thee newsprint manufactured in the United States. The strength of the unions is estimated at 60,000 men, most of whom are organized.

Castle-Trethewey

An eight weeks' tour of European manufacturing centers will be made this summer by Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association. The trip was arranged at the suggestion of several leaders of the industry and has been authorized by the American Paper and Pulp Association. Dr. Baker's itinerary calls for stops in Sweden, Norway and Germany, with short visits to Central European countries, his return being from a Mediterranean port. He will pay particular attention to the condition of the paper industry in Finland and Czecho-Slovakia. Dr. Baker also will bear a commission from United States Commerce Department for the making of a special study of the effect on the paper industry in America and abroad of the establishment of new republics in Europe, and the revision of boundaries of old nations, as a result of the war.

At a meeting of the International Paper Company at Saratoga Springs, N. Y., last Wednesday, directors of the corporation with the exception of W. D. Russell, were re-elected for three years. Mr. Russell declined a re-election as vice-president and Malcolm Chase was selected in his place. A resolution was passed approving and commending the action of the management which placed operations on a non-union basis last year, severing all connections with various papermakers' unions. President Dodge said after the meeting. "The company will continue to work on the American plan. We shall not deal with outsiders on questions connected with the labor we employ, but we always shall discuss wages and working conditions with our employees either singly or in groups, and shall co-operate with them to the fullest extent in order to improve their conditions." The company's financial statement showed a surplus of $23,456,220 December 1, last.

An order recently issued by the District Forester at San Francisco puts a ban on the defacing of trees in California's national forests with advertising signs. According to regulations of the United States Forest Service, such advertising is prohibited from all national forests without special permits, which are seldom issued.

An appropriation of $26,700 to reimburse the State of Montana for expenses incurred in suppressing the 1919 forest fires which originated in the national forest reserves, is provided under a bill passed by the Senate last week.

An issue of $6,500,000 in first mortgage twenty year 6 per cent bonds of the Union Bag and Paper Corporation has been offered for subscription through a syndicate in New York headed by the National City Bank.

O. M. Porter, Secretary of the Woodlands Section of the American Paper and Pulp Association, has again been chosen Secretary of the New York Section of the American Society of Foresters.

The American Writing Paper Company's pamphlet, "The Correct Use of Bond Papers," is very much in demand in New York City paper houses. The booklet is the first of a series to be published on the correct use of paper.

In recognition of faithful service rendered over a long period, ten employees of the Kalamazoo Vegetable Parchment Company have been rewarded with substantial bonus checks. The workers, all of whom had completed at least ten years of service in the company's employ, were guests of honor at a supper which brought out a big turnout of their fellow employees.

With a view to utilizing the waste of Aberdeen Harbor mills for raw material in the manufacture of pulp, the Chamber of Commerce of Aberdeen, Washington is discussing with Henning Helin, the British Columbia engineer, plans for the establishment of a wood pulp mill in the vicinity of Aberdeen. The projected mill would use all refuse that is now thrown into mill burners. Eight Harbor mill owners expressed willingness to supply the required raw material for the plant which would be of 100-ton daily capacity and would employ 150 men. The site under consideration is that of the old Michigan mill in South Aberdeen, adjacent to the new Saginaw Timber Company shingle mill.

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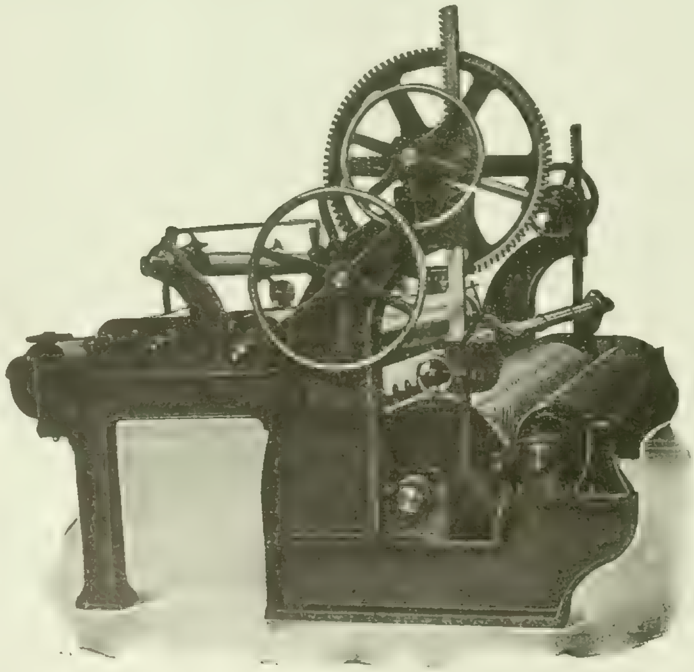

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Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. GARDENVALE, P. Q. May 11, 1922. No. 18

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:-: EDITORIAL :-:

A PERSONAL NOTE

Mother passed away quietly and peacefully on Monday. It is fitting that a word be said in appreciation of the love, sympathy, sacrifice, encouragement and happiness which she gave us children according to our need. There were nine of us, altogether; eight are left to cherish memories such as we wish all might have of their parents. Our souls, our minds, and our bodies were always in mother's thoughts, and there were very, very few mistakes in her counsel. She taught us to pray, study, work and play, to be honest, industrious and fair. Where we have failed of the ideal is not the fault of either mother or father, who were perfect helpmates, team-mates and partners in life for forty-nine years. And the first bouquet that father gave her is with her now, as the earthly temples of their dear souls lie side by side under a beautiful dogwood tree in the neighborhood where they had their greatest happiness.

RESEARCH EXPENSE IS NATIONAL ECONOMY

by A. R. R. Jones

Are we to hear nothing further of the Research Institute proposal? When the bill providing for the Research Institute met its death, last session, at the hands of the Senate, a great and grave error was committed. It was an error that called for repair at the earliest possible moment. The action of the Senate placed a heavy responsibility on that body. And not on that body alone, but on any Government which continues to hold office while the Statute Book still lacks a measure providing for a Research Institute.

The Research Institute bill passed by the House of Commons, and rejected by the Senate, last year, modest as it was, gave considerable promise of being a real and greatly-needed help to those engaged in scientific research. It was a Government measure, but, in spite of this, it met with a point-blank refusal to pass it at the hands of the Senate, which contained a majority of supporters of the then Government. This ill-advised action was based on grounds of economy. But, as a fact, it must have been not considerations of real economy, but rather of that false economy, known as parsimony, which dictated such a move. For the very essence of the Research Institute proposal was that it would help towards true economy.

It is no exaggeration to say that Canada is gravely menaced today — menaced industrially, commercially and scientifically — by the very lack of what the Research Institute was calculated to provide. The deplorably inadequate state of development of Canada's fuel and iron-ore deposits, the waste of forests and fisheries, the lack of oil yielding resources under commercial development—these things are a real menace to the comfort and happiness of the people. Economy, forsooth! It is not economy for Canadians to be forced to buy goods abroad that can be produced or mined at home. It is, on the other hand, the very truest economy to develop processes that will obviate any such necessity—and to obviate any such necessity, was the prime and primary motive inspiring the demand for the Research Institute.

For our part, knowing the hard task that lies ahead of this country in meeting necessary current expenditures, to say nothing of the urgent desirability of proceeding to the reduction of our public debt, we would be among the last to advocate, at this juncture, any expenditure which we did not believe to be vital and essential to the well-being of the country at large. But it is because we realize how serious is Canada's position owing to the lack of development of processes of the kind to which we have adverted, that we maintain that the short-sighted parsimony that dictates delay in the development of scientific research is the one thing, above all others, that Canada cannot afford —one of the main things too, that is making her poor and humiliatingly dependent.

It is probably not far wrong to say that the Senate's action in killing the Research Institute bill, last session, had an adverse effect on most of the industries in the country. For, with all of them, intense concentration on the costs of production was an urgent need, and with some of them a vital need, if they were to maintain even a semblance of the export markets which they secured in war-time. Moreover, the action in question betokened a curiously inadequate understanding of the necessity of Governmental co-operation with business under present-day conditions. In almost any European country, the comparatively small assistance which was asked for — $1,000,000 — would have been given gladly, and almost as a matter of course, in the knowledge that it could not fail to benefit and stimulate the industrial life of the whole country.

It is surely not too much to hope that the Government now in office will lose no time in introducing into Parliament a bill of similar purport to the defunct Research Institute bill and that the Senate will no longer persist in blocking a policy that is being followed by every enlightened nation, but will show itself more alive to the exigencies, industrial, commercial and scientific, of the days in which we live.

ANDREW CARNEGIE GIVES YOU A TIP

(Picked up and passed on by the Broke Hustler.)

Andrew Carnegie started at the very lowest rung of the ladder and mounted to the very top.

He started below where you are now and climbed to the top. You can climb just as high, provided you follow the same principles.

Remember, the amount of money you make is not the measure of your success in life. Success in life is not amassing a fortune. It is something very, very different. But a certain amount of wealth is an absolute necessity.

Andrew Carnegie's success was based on giving full value, and more, for every dollar he was paid. That was the whole basis of his immense fortune,—doing more than he was paid for. In his autobiography he tells a story of his first increase in pay, which is well worth your while to study, for the same principles on which he climbed the ladder are as true today as they were then.

Here is Carnegie's own story of the days when he was a mere messenger boy.

The incident in my messenger life that at once lifted me to the seventh heaven, occurred one Saturday evening when Colonel Glass was paying the boys their month's wages.

We stood in a row before the counter, and Mr. Glass paid each in turn. I was at the head and reached out my hand for the first eleven and a quarter dollars as they were pushed out by Mr. Glass. To my surprise he pushed them past me and paid the next boy. I thought it was a mistake, for I had heretofore been paid first, but it followed in turn with each of the other boys.

My heart began to sink within me. Disgrace seemed coming. What had I done or not done? I was about to be told that there was no more work for me. I was to disgrace the family. That was the keenest pang of all.

Did More, Was Paid More

When all had been paid and the boys were gone Mr. Glass took me behind the counter and said that I was worth more than the other boys, and he had resolved to pay me thirteen and a half dollars a month.

My head swam; I doubted whether I had heard him correctly. He counted out the money. I don't know whether I thanked him; I don't believe I did. I took it and made one bound for the door and scarcely stopped until I got home. I remember distinctly running or rather bounding from end to end of the bridge across the Allegheny River—inside on the wagon track because the footwalk was too narrow. It was Saturday night. I handed over to mother, who was the treasurer of the family, the eleven dollars and a quarter and said nothing about the remaining two dollars and a quarter in my pocket—worth more to me then than all the millions I have made since.

Tom, a little boy of nine, and I slept in the attic together, and after we were safely in bed I whispered the secret to my dear little brother. Even at his early age he knew what it meant, and we talked over the future. It was then, for the first time, that I sketched to him how we would go into business together; that the firm of Carnegie Brothers would be a great one, and that father and mother should yet ride in their carriage. At the time that seemed to us to embrace everything known as wealth and most of what was worth striving for.

A Proud Father and Mother

On Sunday morning with father, mother and Tom at breakfast, I produced the extra two dollars and a quarter. The surprise was great, and it took some moments for them to grasp the situation, but it soon dawned upon them. Then father's glance of loving pride and mother's blazing eye soon wet with tears told their feeling. It was their boy's first triumph and proof positive that he was worthy of promotion. No subsequent success or recognition of any kind ever thrilled me as this did.

ADVERTISING TO STOP FOREST FIRES

In its numerous campaigns to win public co-operation in prevention of forest fires, the Canadian Forestry Association each Spring is assisted by several hundred companies who volunteer to substitute for their regular 'ads' in local newspapers and magazines special fire prevention messages. Many companies having no newspaper advertising have assumed the cost of running a fire prevention advertisement for considerable periods. The Association has requested the Canadian Pulp and Paper Magazine to ask its readers to use one or other of the following forms of copy in any local papers where they already carry space. We are sure that this request will find many companies ready to accede. Here are three forms of special reading matter which can be effectively arrange in bold display by the local newspaper.

FOREST FIRES ARE JOB KILLERS

We Can't Afford Them

Ninety per cent of all forest fires are caused by carelessness of campers, fishermen, and other travellers in or near the woods.

Therefore, build your camp fire in a safe spot. When through using it, put it out. Put it dead out! Never throw away lighted 'smokes' in or near the woods.

Take a few precautions against forest fires. Not just because the law says so but because it's Right.

This advertisement inserted as a contribution to forest protection by. . . . .

TAKE TO THE WOODS

But when you come out, for goodness sake leave the woods behind you. Don't burn them up.

Almost half of all the forest fires in Canada last summer were started by camp fires and 'smokes'. The guilty campers and smokers didn't "mean to", didn't "intend to" etc., etc. But the forest was turned to ruin just the same.

Put your camp fire out. Dead out. That's a matter of fair play and good sportsmanship.

Forest Protection is your personal business.

This advertisement inserted to assist forest protection by . . . .

THE FOREST IS YOUR BEST FRIEND

Treat it as a friend should. Treat is as a place you'll use again. And as a place the other fellow will expect to use. Play Fair to your neighbor. Don't start forest fires.

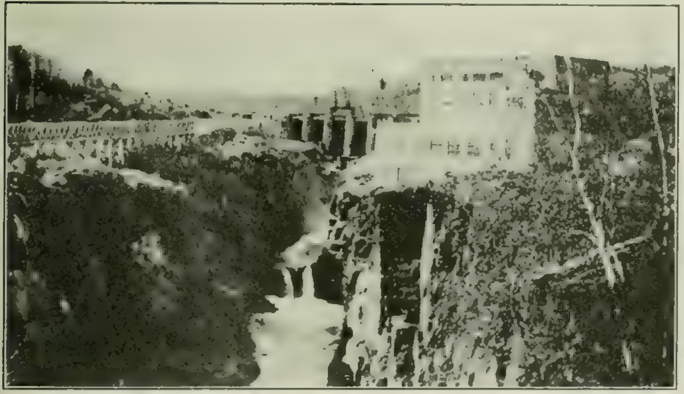
This advertisement inserted to assist forest protection by . . . .

Water Power in the Pulp and Paper industry in Canada

The manufacture of pulp and paper is one of Canada's outstanding industries and the normal progress during the past few years is an indication of the rapid expansion which may be expected in the future. According to the Bureau of Statistics figures for 1920 the pulp and paper industry in Canada represented a total capital investment of $347,553,333, found employment for 31,298 persons whose yearly wages and salaries amounted to $45,253,893, while the value of the products totalled $214,421,546. The export trade of $120 in 1890 for this industry is often contrasted with the present corresponding figure of over $100,000,000 to demonstrate the remarkable expansion during this period.

Importance of Cheap Power

The question of motive power in connection with the production of pulp and paper is a most vital one and, in fact, is almost as important as that of raw material. In any industry the relative necessity of obtaining cheap and adequate power may be gauged by the amount required per dollar of product and with the possible exception of certain electro-chemical and metallurgical processes, the requirements for pulp and paper are among the highest. The importance of cheap power may be judged from the fact that it takes practically 100 h. p. to make a ton of paper per day. It is, therefore, little surprising that motive power used in this industry is practically restricted to hydraulic energy and Canada's supremacy in the pulp and paper field rests on adequate and abundant water powers well distributed among extensive forest resources.



9,000 h.p. hydro-electric plant under head of 110 ft. supplies Bathurst Co. mill.

Location of the Belgian Industrial Co. at Shawinigan Falls.

A few general details are here given to show how this large amount of power is consumed in the operation of pulp and paper mills. Average figures in connection with a large Canadian mill show that mechanical pulp requires 73 h.p. per ton of daily output of which 67 h.p. is for grinding alone; sulphite pulp requires 8.7 h.p. per ton of daily output, and in other large mills as high as from 20 to 30 h.p., while the production of newsprint from pulp consumes 12 h.p. for the same unit output. The continuous operation of mills in this industry, usually 24 hours per day, permits a very advantageous use of the necessary power and with direct water power or hydro-electric energy, further allows a cheap unit cost for the amount consumed. For instance, one of our Canadian sulphite mills with an installation of 1,500 h.p., purchases hydro-electric power on the basis of $1 per h.p. per month plus a consumption charge on a sliding scale, and it was found that the minimum rate of 0.1 cent per k.w.h. could be taken advantage of for about 75 per cent of the total consumption, thus reducing their unit power cost very materially.

Water Power Installations for Pulp and Paper Industry

In view of the very prominent place which the pulp and paper industry has acquired in Canada and further conscious of the important part which our water power resources are playing in the development of this field, the Dominion Water Power Branch recently undertook a special study in this connection and has gathered much information on power installation and requirements at pulp and paper mills operated by water power or by purchased hydro-electric energy. For the sake of brevity the general term "pulp and paper mills" has been adopted throughout this review and in the tables as including *pulp* mills, *pulp and paper* mills, and *paper* mills. The principal power and other features are presented in tabular form while the accompanying map shows the location of the various mills listed.

The water-power installation for the operation of pulp and paper mills in Canada aggregates 476,503 h.p. while the additional hydro-electric energy purchased for this industry is 160,577 h. p., giving a total of 637,080 h. p. This covers the energy derived directly or indirectly from water power but does not include mills where steam only is used as motive power. The use of steam as a source of power in this industry is very limited and in most cases is prompted by special conditions such as operation in close connection with the manufacture of lumber when refuse from the latter can be used as fuel under the boilers. The census returns (1920) show a total steam power installation in pulp and paper mills in the Dominion of only 62,400 h.p. and if the capacity of the three or four larger steam operated mills where special conditions obtain is excluded, the remaining unit capacity works out to a very small amount.

The electric drive is an important consideration in this industry. Of the total water-power installation for the various mills a total of 178,911 h.p. is converted into electrical energy before it is used to operate the pulp and paper machinery. The advantages of electric drive are numerous; a uniform speed is assured which is of primary importance in governing the quality of the products; it

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* This excellent review of the water power developments of Canada was prepared by the Dominion Water Power Branch, of which Mr. J. B. Challies is Superintendent.

TABLE NO. 1.
PULP AND PULP AND PAPER MILLS IN CANADA OPERATED BY WATER POWER.

Compiled by Dominion Water Power Branch,
February 2nd, 1922.

BRITISH COLUMBIA

Index No.	Ref. No.	Owner or Company	PLANT or MILL: River	Location	Head in Feet	Turbine Installation: No. of Units	Turbine Installation: Total H. P.	Foot Notes
1	2	3	4	5	6	7	8	9
$8FD_1$	1	Pacific Mills, Vancouver	Link	Ocean Falls	140	12	20,550	e
$8FD_5$	2)		Swenson cr.	1 mi. from Swanson Bay	130	4	1,750	e
$8GA_4$	3)	Whalen Pulp & Paper Mills, Ltd., 650 Pender St., W., Vancouver	Mill cr. and Cedar cr.	Woodfibre "	580 1,100	3	1,250 950	e
$8HE_3$	4)		Victoria lake	Port Alice	400	1	300	e
$8GB_1$	5	Powell R. Co., Ltd., Vancouver	Powell	Powell	147	7	24,000	e
				TOTAL			48,800	

ONTARIO

Index No.	Ref. No.	Owner or Company	River	Location	Head in Feet	No. of Units	Total H. P.	Foot Notes
$5PC_1$	6	Fort Frances Pulp & Paper Co., Limited	Rainy	Fort Frances	28	9	18,000	e, b
$5QD_1$	7	Dryden Pulp & Paper Co., Ltd.	Wabigoon	Dryden	45	2	1,800	e
----	11	The Spruce Falls Co.	Kapuskasing	Kapuskasing	--	-	------	a
$4LB_1$	12	Mattagami Pulp & Paper Co., Ltd.	Mattagami	Smooth Rock Falls	36	3	9,350	e
$4MC_1$)	13)	Abitibi Power & Paper Co., Ltd., Montreal	Abitibi	Iroquois Falls	41.5	14	28,000	e
$4MC_2$)	13)		"	Twin Falls	60	4	24,000	e
$2CA_2$	14	Spanish River Pulp & Paper Mills Ltd., Toronto	St. Marys	Sault Ste. Marie	18	12	14,400	
$2CE_3$	15	" " " " " "	Spanish	Espanola	63	8	15,820	e
$2DC_1$)	16)	" " " " " "	Sturgeon	Sturgeon Falls	36	11	13,390	e
$2DC_2$)	16)	" " " " " "	"	10 mi. north of Sturgeon Falls	35	2	5,200	e
$2HB_4$	19	Provincial Paper Mills, Toronto	Credit R.	Georgetown	12	1	65	p
$2HE_{21}$	20	" " " " "	"	"	21	2	150	e,p
$2HB_{28}$	21	John Fisher & Son, Ltd.	Morden's cr.	Dundas	42	2	312	
$2HA_7$	22	Garden City Paper Mills, Ltd.	Old Welland Canal	St. Catharines	12	2	285	
$2HA_8$	23	Kinleith Paper Mills, Ltd.	" " "	"	21	2	605	p
$2HA_{10}$	24	Lincoln Paper Mills	" " "	Merritton	18	4	639	
$2HA_{32}$	25	" " "	" " "	"	25	3	1,450	e
$2HA_{15}$	26	Riordon Co., Ltd.	" " "	"	14	3	650	e,p
$2HA_9$	28	Provincial Paper Mills, Toronto	" " "	Thorold	14	2	1,040	e
$2HA_{23}$	29	" " " " "	" " "	"	12	3	453	
$2HA_{11}$	30	Beaver Wood Fibre Co., Ltd.	Welland Canal	"	22	2	680	p
$2HA_{12}$	31	Thorold Pulp Co.	Old Welland Canal	"	12	5	614	
$2HK_6$	36	Canadian Paperboards Co., Ltd., Montreal, P.Q.	Trent	Frankford	13	5	1,080	e,p
$2HK_{12}$	37	Miller Bros. Co., Ltd., Montreal	"	4 mi. from Trenton	11	4	684	e
$2HL_1$	40	Belleville Paper Mills, Ltd.	Moira	Belleville	14	2	90	p
$2HM_4$	41	Strathcona Paper Co.	Napanee	Strathcona	8	2	153	p
$2HM_{25}$	42	Specialty Paper Mills	"	Camden East	18	1	125	
$2LA_{12}$	43	The Bronson Co.	Ottawa	Ottawa	29	1	2,000	
$2LA_{13}$	44	J. R. Booth, Ltd.	"	"	30	13	28,789	e
$2MC_{11}$	46	Howard Smith Paper Mills, Montreal, P. Q.	Cornwall canal	Cornwall	8	13	800	e,p
				TOTAL			170,624	

NOVA SCOTIA

Index No.	Ref. No.	Owner or Company	River	Location	Head in Feet	No. of Units	Total H. P.	Foot Notes
$1DL_2$	106	Sissiboo Pulp & Power Co., Ltd., Weymouth	Sissiboo	Weymouth Falls	60	4	3,120	e
$1EB_5$	107	Clyde Pulp Co., Halifax	Clyde	Port Clyde	20	4	1,800	e
$1ED_2$	108	MacLeod Pulp & Paper Co., Ltd., Liverpool	Mersey	Rapid Falls	33)	14	6,024	
$1ED_3$	109	" " " " " "	"	Cowie Falls	22)			
$1EE_{11}$	110	Panstock Corporation	Medway	Harmony Mills	38	2	2,250	e
$1EE_3$	111	Nova Scotia Wood Pulp & Paper Co., Ltd. Charleston	"	Mill Village	18	3	1,625	
$1EF_1$	112	La Have Pulp Co., Ltd., New Haven, Conn.	La Have	New Germany	30	6	1,500	
$1DD_{15}$	113	Gaspereau River Light, Heat & Power Co. Wolfville	Gaspereau	Whiterock	30	1	580	
$1DE_3$	114	St. Croix Paper Co., Ltd., Halifax	St. Croix	Hartville	28	3	100	
$1DE_4$	115	Panuke Pulp & Paper Co., Ltd., Windsor	" "	"	27	3	1,000	
				TOTAL			17,999	
				CANADA			476,503	

(a) Under construction.
(b) Portion of power is exported to U.S.
(e) All or portion of power converted to hydro-electric energy.
(p) Hydro-electric energy is also purchased from an outside source.

TABLE NO. 1 (Continued)

- 2 -

QUEBEC

Index No.	Ref. No.	Owner or Company	PLANT or MILL					Foot Notes
			River	Location	Head in Feet	Turbine Installation		
						No. of Units	Total H. P.	
1.	2.	3	4	5	6	7	8	9
2JE$_5$	49	Riordon Co., Ltd.	Gordon cr.	Timiskaming	214	2	7,200	e
2LA$_{11}$	51	E. B. Eddy Co., Ltd.	Ottawa	Hull	34	7	14,149	e
2LF$_2$	52	Jas. MacLaren Co., Ltd.	Lièvre	Buckingham	45	8	8,125	
2LC$_{13}$	53	J. C. Wilson, Ltd.	North	Lachute	18	9	1,200	
2LC$_{10}$	54	Rolland Paper Co., Ltd.	"	St. Jérôme	25	4	800	e
2LC$_{36}$	55	J. C. Wilson, Ltd., Montreal	"	" "	33		954	
2LC$_{11}$	56	Rolland Paper Co., Ltd.	"	Ste. Adèle	100	5	1,325	
2MC	58	Howard Smith Paper Mills, Ltd., Montreal		Beauharnois			300	p
20A$_3$	59	Canadian Paperboard Co.	Lachine Canal	Montreal	9	2	180	e,p
20A	60	J. R. Walker & Co., Ltd., Montreal	Ottawa	Sault au Récollet	7		850	
20E$_{33}$	62	Howard Smith Paper Mills, Ltd., Montreal	Lac Ouareau	Crabtree Mills	29	1	1,200	e
20B$_4$	63	Alex. McArthur & Co., Ltd., Montreal	L'Assomption	Joliette	12	3	275	p
2NG$_{11}$	67	Belgian Industrial Co., Ltd.	St. Maurice	Shawinigan F.	140	20	17,910	p
2NE$_1$	69	Brown Corporation, Portland, Me.	" "	La Tuque	35	2	3,200	e
20D$_2$	70	Dominion Paper Co., Montreal	Nicolet	Kingsey Falls	24	3	880	e
20D$_{22}$	71	Lotbinière Lumber Co.	"	Danville	57	5	1,680	e,p
20E$_{13}$	72	Brompton Pulp & Paper Co., Montreal	St. François	East Angus	55	13	10,701	p
20F$_{11}$	73	" " " " " "	" "	Bromptonville	30	9	10,316	e
20F$_4$	74	Canada Paper Co., Ltd., Montreal	" "	Windsor Mills	15	15	5,025	p
2PJ$_{13}$	75	Lake Megantic Pulp Co.	Chaudière	Lake Megantic	20	5	1,550	
2PC$_1$	76	Rowland Ford & Son	Portneuf	Portneuf	22	3	450	e
2PC	77	Ru-Ber-Oid Felt Mfg. Co., Ltd., Montreal	"	"			750	
2PC$_{16}$	78	Montreal Paper Ltd.	"	" Stn.	18		250	p
2PC	79	Joseph Ford & Co.	"	" " (No. 1 Mill)	8)			
2PC	80	" " " "	"	Portneuf Stn. (No. 2 Mill)	15)		250	p
2PC$_6$	81	Eastern Paper Co., Ltd.	"	St. Basile	13	2	130	
2PC$_{10}$	82	Joseph Piché	"	" "	8	1	75	
2PB$_3$	83	News Pulp & Paper Co., Ltd., Montreal	Ste. Anne	St. Raymond	31	10	4,080	e
2PC$_7$	84	Donnacona Paper Co., Ltd., Donnacona	Jacques Cartier	Pont Rouge	65	1	1,000	
2PC$_{21}$	85	Bird & Son, Ltd., Hamilton, Ont.	" "	" "	17	7	1,384	e
2PC$_2$	86	Donnacona Paper Co., Ltd.	" "	Donnacona	60	5	6,000	e,p
2PH$_{15}$	87	Henry Atkinson, Registered	Etchemin	St. Romuald	26	4	946	e
2PH$_{26}$	88	" " "	"	" "	10	4	167	
2PE	89	Richard & Co., Quebec	Petit Pré	L'Ange Gardien	600		500	
2RG$_7$	90	La Cie de Pulpe de Chicoutimi, Chicoutimi	Ouiatchouan	Val Jalbert	254	4	7,300	
2RC$_2$	91	Quebec & Saguenay Pulp Co.	Little Peribonka	St. Amédée de Peribonka	22	5	1,500	e
2RH$_9$	92	Jonquière Pulp Co., Quebec	Au Sauble	Jonquière	65	3	4,500	
2RH$_{13}$)		Price Bros. & Co., Ltd., Quebec	" "	Kenogami	265	8	26,200	e
2RH$_{14}$)		" " " " " "	Shipshaw	Ste. Anne de Chicoutimi	90	3	10,600	c,e
2RH$_{17}$)	93	" " " " " "	"	Chute aux Galets	101	2	17,600	c,e
2RH$_4$	94	La Cie de Pulpe de Chicoutimi	Chicoutimi	Chicoutimi	105	6	10,850	p
2RH$_8$	95	La Cie de Pulpe de Chicoutimi, Chicoutimi	Chicoutimi	Chicoutimi	85	6	9,350	p
2PF$_2$	97	Donahue Bros., Reg'd	MurrayBay	Murray Bay	58	5	9,000	e
2PG$_3$	98	Wolf River Pulp & Paper Co.	Rivière du Loup	Rivière du Loup	75	3	3,160	
2PG$_4$	99	F. Flo Soucy	" " "	Old Lake Road	40	2	800	
2QA$_3$	100	Price-Porritt Pulp & Paper Co., Quebec	Rimouski	Rimouski	52	2	3,150	e
2UB$_1$	101	Gulf Pulp & Paper Co.	St. Marguerite	Clark City	54	7	11,000	e
2QC$_3$	102	Great Eastern Paper Co., Montreal	Madeleine	Madeleine	(102) (22)	2	5,600	e

TOTAL 224,412

NEW BRUNSWICK

Index No.	Ref. No.	Owner or Company	River	Location	Head in Feet	No. of Units	Total H. P.	Foot Notes
1AD$_1$	103	Fraser Companies, Ltd.	Madawaska	Edmundston	24	2	3,000	e
1BK$_1$	104	Bathurst Co., Ltd., Bathurst	Nipisiquit	Grand Falls	110	2	9,000	e
1AQ$_1$	105	St. George Pulp & Paper Co., South Norwalk	Magaguadavic	St. George	46	4	2,668	e

TOTAL 14,668

(c) Hydro-electric plants supplying Kenogami and Jonquiere mills.
(e) All or portion of power converted to hydro-electric energy.
(p) Hydro-electric energy is also purchased from an outside source.

also allows the centralized operation of a large mill receiving power from several hydro-electric sources while a closer study of power conditions, adjustment and consumption is permitted. A well known authority on pulp and paper mill operation in Canada recently stated that the proper way to build a paper mill was to develop the power as a hydro-electric project and locate the mill at a place most suitable from the operating and shipping point of view, adding that the time for direct connecting of turbines to grinders was past.

Water Power Installation at Each Mill

TABLE No. 1 presents a complete list of pulp and paper mills in Canada operated by water power showing the principal features in connection with the motive power installation. A uniform index system for all water-power sites has been adopted throughout Canada and the first column gives the designation under this system of the particular water power operating the mill referred to. Column 2 gives the special reference numbers on the accompanying map from which the location of the mill or power development can readily be found. Column 3 gives the name of the owner or company operating the mill, this being also accompanied by the head office address where latter is not at the mill; where no address is given under this column it may be taken as that given under Column 5. The name of the river from which power is obtained is shown under Column 4 while the head of water utilized in the development is given under Column 6. The latter is often an important factor in the cost of power, a development under a high head being usually more economical. The number of turbine units installed to operate the mill and their total capacity, given in Column 7 and 8, bring out the principal points in connection with power requirements of the mill and give an idea of its importance while its efficient operation may also be judged from the average size of each turbine unit installed. A number of mills, while producing their own power, convert the whole or a portion of the latter to hydro-electric energy before using it throughout the mill; as this is an important feature in modern operation, mills where such conditions exist are marked (e). There are a number of cases where the hydro-electric power used at the mill is generated quite a distance from it, this practice being made possible through the ease with which the electric energy can be transmitted. In most instances, the pulp and paper mill is installed at a water-power site and when gradual expansion has necessitated additional motive power, another nearby hydraulic site has been developed and hydro-electric energy transmitted to the mill to permit centralized operation. In the Lake St. John district in Quebec province one of the large mills receives energy from two hydro-electric plants located a few miles away and operated by the same Company in addition to the water power developed at the mill itself. In addition to the power produced for the particular purpose of operating the mill many pulp and paper organizations in Ontario and Quebec also purchase hydro-electric energy from outside sources and the installation given under Column 8 does not represent the full capacity required; these mills are marked (p) in the last column of the table, to show that additional energy is purchased.

(*To be Concluded.*)

NEW MEMBERS OF TECHNICAL SECTION

Among the recent additions to the ranks of the Technical Section of the Canadian Pulp and Paper Association are Mr. F. W. McCrea, 52 McGill College Ave., Montreal, student member, and Mr. R. C. McCulley, Fort Frances Pulp and Paper Co., Fort Frances, Ont., Junior member.

What the A. P. & P. A. Did

Watertown, N. Y., May 5. — Ten accomplishments of the year 1921 were cited by Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Association, when he addressed a conference of members of the Association from the Black River District an invited guests at the Black River Club this noon. The conference was held to determine what practical assistance could be renderer the manufacturers of this region by the central organization and to get this work started before Dr. Baker goes abroad this summer to investigate for the American paper industry the status of the paper industry in Europe, particularly in Scandinavia:

"Through the central organization it has been possible to achieve some important results during the last year," said Dr. Baker, "results which could not have been accomplished by the manufacturers working individually. The ten which are probably of greatest importance to the entire industry are the following:

"Made presentation for the paper industry of tariff brief which won very favorable comment from the Senate Finance Committee.

"Through strong committee from the industry influenced the establishment of a Paper Division in the Department of Commerce.

"Established Information Service as clearing house for statistical and informational material for use within and without the industry.

"Developed Woodlands Section for pulpwood statistics and direct service to those responsible for the woods operations of the paper industry.

"Aided in preventing passage by Congress of hastily drawn bills on stream pollution which would have closed many paper mills, and joined Secretary Hoover in asking investigation to determine proper legislation.

"United important industrial and social organizations in campaign for national forestry legislation.

"Stimulated governmental and mill studies of wood and pulp decay prevention.

"Established cooperation through a standing committee of the Association with the U. S. Bureau of Standards.

"Accomplished closer co-ordination of the Technical, Cost, Salesmen's and Superintendents Associations, extending their service to all members of the Association.

"Conventions in New York and Chicago, co-ordinating more closely than ever before all elements of the industry."

BRITISH WEST INDIAN TARIFFS RECENTLY PRINTED FOR DESTRIBUTION

Copies of the new preferential tariff of Dominica, B. W. I., adopted in pursuance of the Canada-West Indies Trade Agreement, have been reprinted from the Weekly Bulletin of December 12, 1921. Any interested firm may obtain a copy of this tariff on application to the Director, Commercial Intelligence Service, Ottawa. The new tariffs of St. Kitts-Nevis, Antigua, St. Lucia, and St. Vincent have also been printed recently and are available for distribution.

PRIZE PORCUPINE KILLER

The special prize of Five Hundred Dollars in cash offered by F. J. D. Barnjum for the largest number of porcupines killed in Nova Scotia during the month of April has been awarded and paid to Joseph R. Ogilvie, Greenville Station, Cumberland Co., N. S., who killed the highest number.

The Underfeed Stoker Company of Canada, Limited announce the removal of their head office from 81 Victoria Street to 505 York Building, 146-152 King Street West, Toronto.

CANADIAN-MADE ABRASIVE PAPER

The dust from one of Victoria's hitherto unadvertised industries is already changing the aspect of the surrounding scenery. So it is quite time to call attention to the establishment in the city of a sandpaper factory, the first industry of the kind to operate in the Dominion, although since its incorporation in February, 1921, a firm of the same nature has started up in the East. Incorporated under the name of "The Western Abrasive Paper Company, Ltd.," the local concern came into being with a capital of $20,000 in 4,000 ordinary shares of $5 each. Over $18,000 of this amount has been subscribed and paid up by the twenty-five shareholders, whose returns from the investment promise to be highly satisfactory, judging from the number of inquiries and orders which are coming in from all parts of this continent and from much further afield. The fact that the local concern was the first of its kind in Canada has given it the advantage of some leeway in securing the Western market, both in Canada and the Far East, and there is little doubt that sales will forge ahead and the industry come to occupy a very important position.

The new company, which actually commenced operations last December, was formed for the manufacture of sandpaper and garnet paper. Fortunately, with the exception of the garnets, which are imported from Alaska, where the firm has its own leaseholds, all the materials necessary to the manufacture of the output are procurable in the home markets. Mr. J. R. Near, the managing director, stated to The Colonist (Vancouver) that he believed very shortly it would be possible to secure even the garnets from British Columbia mines. The quartz which is used in the manufacture of the sandpaper comes from the Prince Rupert district; the paper comes from Ocean Falls. Some of the glue is imported from France, some from the United States, some from England. But the major supply is Canadian. Thus the Abrasive Paper Company's product may be said to be almost wholly Canadian.

Local-Made Machinery

Mr. Near, it should be noted, invented all the machinery, and all the machines, with the exception of the big manganese steel crushing rolls, have been made in Victoria from his designs.

In addition to the managing director, Mr. Near, there are at present five men employed about the works, each man being a substantial shareholder in the company. In fact over $10,000 worth of the issued stock is owned by the employees. Dr. Lewis Hall is president of the company, other directors being Mr. A. J. Moore, Mr. W. Kendrew, Mr. E. C. Frank Allen, and Mr. J. R. Near. Three of the five directors are constantly "on the job." The secretary is Mr. Edwin Coventry.

Supplies

The company has a lease on eleven garnet mining claims in Alaska, and 12 tons of garnets have already arrived and been crushed. A shipment of 30 tons of quartz from the Prince Rupert district has been received and used. This looks like business. In fact business is assured. Inquiries have been received from New Zealand, Demarara, Peru, China, Korea, and Australia. Mr. Chas. Rant, of Messrs. Jones & Rant, has taken up the sale of the Abrasive Paper Company's output in New Zealand. Shipments have already been dispatched to points as far east as Winnipeg. Vancouver affords another big market which promises to be considerably bigger in the very near future.

Fourteen grades of paper are turned out, and the fact that all these grades had to be ready before the company could solicit orders was one of the reasons for the tardiness in permitting information about the concern to reach the public. Now that the initial difficulties have been surmounted and the industry has passed the experimental stage there is nothing to hinder rapid development, although even yet the directors are moving with certain caution, and do not expect the factory to attempt its maximum for many months.

Use of Product

One might reasonably wonder what is the basis of the large quantities of sandpaper and garnet paper. But a little observation indicates some of the hundred and one uses which the article has. Garnet paper, for instance, is much used by shoemakers on their machines. In rolls it is used by the mills for finishing woods; sandpaper is used chiefly by painters, carpenters, and cabinet-makers, although it has many minor uses such as for cleaning golf clubs, and in many domestic and household services such as polishing saucepans, Hitherto all the sandpaper and garnet paper used in this country was imported from England and the United States. Victoria has the privilege, therefore, of claiming first honors for the industry in Canada.

Process

Mr. Near described the process of manufacture. The abrasive material used, viz., crystalline quartz and garnets, is crushed and graded through sieves varying from 25-200 mesh to the inch. The making and drying departments is situated on the second floor, and the finished up from the crushing room below by an elevator, afterwards being carried along an elevated gangway to the sandhopper of the making machine. This making machine prints, glues and sands the paper in one operation, and after passing through the machine at the rate of 100 feet per minute, the paper is carried up an inclined plane on rods and draped in festoons which move slowly forward to make place for other festoons. This movement continues until the drying-rack is filled.

It takes about twenty-four hours for the paper to dry after it is glued and sanded. This operation is usually carried out about ten o'clock in the morning, and by the time the next morning's operation is to take place the previous day's output is ready to pull down to the first floor, and the last process of all, the cutting into sheets and making packets, is carried out as expeditiously as possible.

James D. Rice, representing a syndicate of creditors of the recently failed Maine Pulp and Paper Company, has purchased the firm's Skowhegan property from its trustee in bankruptcy. A new corporation, to be known as the Skowhegan Paper Company, has been formed by the creditors of the former corporation. Officers elected from among the creditors, who are stockholders in the new corporation, are the following: Harold Hinckley of Bangor, president; James D. Rice, treasurer; Ballard Keith, clerk. The company is capitalized at $400,000 preferred, $200,000 and the remainder common. Operations are to be resumed at an early date.

"As His custom was he went into the Synagogue on the Sabbath day,—Luke 4: 16: Habits of worship learned in boyhood days were practiced by Jesus in manhood; as our boys are today our men will be tomorrow.

AN OPTIMISTIC FORECAST OF PAPER INDUSTRY CONDITIONS

The Daily Mill Stock Reporter (of New York) of April 25th prints the following:

"Not in a long time has the outlook for papermaking been quite so encouraging. On all sides one hears reports of increasing improvement in the new paper situation, of broader demand for the various kinds of finished paper, of paper and board mills increasing operations, and of general paper market conditions becoming better stabilized toward normalcy. As a result, what can one anticipate other than signal improvement in the papermaking raw material situation?

"Figures cited by paper manufacturers at their recent annual convention in New York City showed that paper mills producing most kinds of paper are at present running industry, these figures indicated, is now The fine paper industry, these figures indicated, is now operating at between 75 and 80 per cent of productive capacity; glassine and greaseproof paper mills are running at 75 per cent of full output, tissue and wrapping paper plants are producing a better rate of capacity than in a year or more, while news print and board mills are steadily increasing their production to take care of the more voluminous orders they are receiving.

"Moreover, it is generally conceded that the improved demand for finished paper is due solely to a rise in the consumption of paper. Printers, publishers, book binders, papeterie manufacturers and other large consumers of paper are buying more paper today because they are in need of larger amounts—there are numerous signs that practically all the paper being absorbed by paper buyers is going direct into consumption. There is still an aversion plainly apparent to stocking up paper, both among jobbers and consumers, and the broader demand that has developed recently is founded on the healthiest factors. It, therefore, stands to reason that demand for papermaking materials soon must reflect the marked improvement that has occured in the finished paper trade, and that paper and paper board producers will shortly come into the market to purchase larger quantities of raw stock of which they manufacture their product.

"Improvement in papermaking material has been slow in developing and thus far has amounted to little of importance. Mills seem reculant to buy unless pressed by dire necessity; and orders seldom call for customary tonnage of stock. It seems only a matter of a short time, however, when demand for papermaking material must increase. Mills cannot make paper out of air—they must have raw material and indications point to mill holdings of raw material reaching extremely low levels.

"There are many in the papermaking material trade who do not expect real business to come until next fall. These base their ideas on the fact that invariably the summer is a dull period for paper stock, and that mills will not come actively into the market until after the "dog days" are past. It should be remembered, however, that nearly everyone expects big business in the fall, not only dealers in papermaking material but paper manufacturers themselves. It is probable, therefore, that purchasing agents of the various mills, believing that more or less of a boom in paper will develop in the fall, will endeavor to 'beat the other fellow to it' by laying in stocks of raw material before the expected activity. This will likely bring many mills into the raw material market long before the fall, and we should witness a much livelier market for papermaking materials during the coming summer than in former summers.

"Regarding prices, we have little to say. It naturally follows that when goods are in demand prices advance, but it must be remembered that paper and paper board is being marketed today at low prices, and manufacturers consequently are limited as to the prices they can afford to grant for raw material. We feel, however, that the papermaking materials trade will most certainly experience much more market activity in the very near future, and also that better prices than now prevail will be obtained for cotton rags, waste paper, old rope and bagging and other materials of which paper is made.

GERMAN NEWSPAPERS TO SUSPEND

(Special Correspondence to Pulp and Paper Magazine)

Franfurt, April 20, 1922.—The bitter cry of the German newspapers has a familiar sound. Nevertheless the manager of a large wholesale house assures the writer of the substantial truth of the very gloomy reports in circulation. It is now realised in Germany that the newspapers are in a critical state or one that may be defined as extreme penury. The cost of materials ever increasing, has reached a point where the last act in the drama—total breakdown and suspension—has begun. At the Weimar meeting of the German Newspaper Publishers in March and during a still more recent session of the Reichstag a terrific picture of the poverty of the Press was given by representatives of large and small newspapers of all opinions and parties.

Although this appeal for help has attained wide publicity the chilling influence of custom has rendered the public indifferent to a menace which threatens to ruin civilized life in Germany. It has already begun with individual instances of failure, so it is the general belief that all newspapers, together with the technical press may be compelled to suspend or at least carry out extensive curtailments of size and operating costs.

The blame according to the best opinion must be laid upon the Syndicate and its ruthless price fixing. The paper makers announce that the price of news print which even in January had risen to thirty-five times the peace price will after a short interval be forced up to 60 or 65 times its peace price. It is true that actual suspension will be fought with every means possible. But there is no doubt that the danger is not an imaginary one as it might have been in the past. Suspension is imminent or what is almost the same thing the paper which is used, the type and the very exiguous space allotted for the most important news, and the quality of that news, are all such wretched performances in their different ways that the result is quite as bad as complete breakdown.

The remedies for this state of things, that is, remedies that are being debated in the Reichstag and formulated as demands by the Press may be summarized as follows: 1, Measures against the forcing up of the price of paper; 2, Prohibition of exports of paper and wood pulp; 3, Abolition of all special taxes on the Press.

WAYAGAMACK BONDS SOLD

The syndicate headed by Rene T. Leclerc, who recently purchased the $1,374,500 6 per cent bonds of the Wayagamack Pulp and Paper Co., have disposed of the entire offering and subscription lists have been closed, both in Montreal and Toronto. Arrangements are being made to have the new issue listed on the Montreal Stock Exchange.

Problems in Cellulose Chemistry

Translated and Abstracted from "Zellstoff und Papier" 1 (1921). 248, by John L. Parsons, Hammermill Paper Co., Erie, Pa.

As in well known, over-bleaching of pulp is accompanied by more or less destruction of the fibres. The physical changes are only one part of the phenomema, for by over-bleaching, cellulose is also chemically changed, since it reduces Fehling's solution, like glucose. Witz, investigator in textile chemistry, has given the resulting substance the name oxycellulose to indicate that the cellulose has been changed by oxidation. The exact nature of this compound is not known, and remains a problem to be solved by the cellulose chemist.

If cellulose is an aliphatic alcohol then the first product of oxidation will be an aldehyde. With simple oxidation products, however, aldehydic groups are easily identified and determined with certainty, but such is not the case with exycellulose. Here we are limited to a few qualitative tests. On the other hand, the oxidation does not stop at the first stage, an aldehyde, but continues to the second stage, an acid. Schwalbe and Becker have recently shown that the number of carboxyl groups, which appear in a definite quantity of oxycellulose, can be determined by titration, and also corresponding salts obtained. Oxycellulose contains aldehydic or acid groups or both according to the degree of oxidation. This substance is not a definite chemical compound like cellulose itself. Therefore it is extremely difficult to isolate definite oxidation products either aldehydes, or acids, or aldehyde-carboxylic acids from oxycellulose.

Accordingly we must assume that the oxycellulose proper is an oxidation product which contains no unchanged cellulose and also no decomposition products of cellulose. In common with cellulose it has a high molecular weight. Tollens and Vignon assume that an unknown number of molecules of unchanged cellulose are combined with the "typical" oxycellulose molecule. They understand that the "typical" oxycellulose molecule is a lactone of an aldehyde-carboxylic acid, so-called glucoronic acid. That this aldehyde-carboxylic acid in some way characterizes the presence of oxycellulose is probable. Besides showing a reducing property, most oxycellulose preparations yield furfurol upon distillation with hydrochloric acid. This is a compound which glucoronic acid yields under the same treatment. Also, the observation of Tollens that isosaccharic acid results when oxycellulose is treated with lime might be explained by the presence of glucoronic acid. Both acids are of the same nature and it is conceivable that, under the influence of lime, glucoronic acid is transformed to isosaccharic acid. However, the relationship between glucoronic acid and unchanged cellulose is not clear.

Experimental work in the author's laboratory shows that it is very difficult to separate the probable carboxylic acid from unchanged cellulose. By heating under pressure with dilute acid, a compound separates which behaves like a carboxylic acid, and in fact it is dibasic. But it has not been possible, as yet, to wholly explain the nature of this derivative. The greater part of the residue which remains after the heating operation is unchanged cellulose.

It is likely that a better understanding of the points, which still remain unsolved, can be obtained if experimental research is based on an hypothesis which may be related to the idea previously expressed but of a broader nature. Based on the results of modern starch chemistry, Hans Pringsheim, and P. Karrer have advanced such an hypothesis in "Cellulosechemie."

Pringsheim believes that cellulose, like starch, is a polymerization product of a simple fundamental substance; in the case of starch this substance is anhydromaltose, so-called diamylose; in the case of cellulose, it is believed that anhydrocellobiose is the simple fundamental substance, appearing as a glucosido-anhydroglucose, a compound in which the anhydroglucose part is acted upon first by active chemical reagents.

The first step in the decomposition of cellulose may occur in a breaking up of the oxygen ring in the anhydroglucose member with an addition of water, that is, aldehyde groups may become free and as a result a polymerized complex is formed which consists partly of cllulose and partly of anhydrocellobiose. The free aldehyde groups belong to the cellobiose member; upon vigorous oxidation they become acid groups and in this way cellobionic acid results from the cellobiose complex. Therefore, it may be considered that oxycellulose is a combination of anhydrocellobiose with cellobionic acid, effected through secondary valence.

As far as the glucoronic acid hypothesis is concerned, Pringsheim holds that the presence of this acid is quite possible, yet it does not occur in the typical oxycellulose formation. According to his opinion the oxydizing agent may, in certain cases, atack an alcoholic group, that is, a stable CH_2OH group of the cellobiose complex, before the oxidation of the freed aldehyde groups takes place, by which derivatives of glucoronic acid will be obtained. In an oxycellulose molecule it may be considered that the derivatives of glucoronic acid are coupled to a glucose molecule.

The author prefers to believe that there must be an exact differentiation between the two different hypotheses in question; either conforming to the latterly stated possibility, the glucoronic acid hypothesis, or according to the first mentioned theory, the cellobionic acid hypothesis. Which of the two hypotheses proves to be correct depends upon which group of the cellobiose member is attacked by oxidation. The oxidation undoubtedly occurs in the one place or the other. The solution of the question rests on chemical research concerning cellobionic acid and also glucoronic acid.

Pringsheim's hypothesis has, in general, much to offer. It explains the reactions of oxycellulose very well, also the formation of isosaccharic acid. If it refers to the presence of a glucosidic-membered glucose group, such as is found in milk sugar (lactose), but not to the presence of free glucose, then oxycellulose contains a grouping which makes possible the ready formation of issosaccharic acid.

Moreover, Pringsheim's hypothesis presents one point of special significance. According to the suppositions already expounded the process of oxycel-

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Abstracted from an Address by Professor Emil Heuser at the Annual Meeting of the Society of the Pulp and Paper Chemists and Engineers in Berlin, Germany, November, 1921.

lulose formation may be divided into two stages: the first stage involving a decomposition, that is, hydrolysis with a breaking down of the oxygen ring (hydrocellulose stage); the second stage, the real oxidation (oxycellulose stage). This may be the case when nitric acid, both an oxidizing and a hydrolytic agent, or even hydrogen peroxide, are used in the preparation of oxycellulose. Both products, hydro- and -oxycelluloses are, so to speak, transformed into one another. True oxycellulose, however, may be identified by the presence of carboxyl groups, by its acid nature, and certainly by the splitting off of furfurol. By these tests hydrocellulose is sharply differentiated from true oxycellulose. Carbonic acid evolves when oxycellulose is distilled with hydrochloric acid; 1.53 per cent of carbon dioxide was obtained in this manner from an oxycellulose which had been prepared with chromic acid, 0.03 to 0.06 per cent was obtained from hydrocellulose and also from pure cotton cellulose.

It is possible that in the transformation of both products the reason may be found why the furfurol yield does not seem to be characteristic for all oxycellulose preparations, a phenomenon which has been pointed out many times by Schwalbe.

The author believed that the conception of "hydrocellulose", stated in his "Lehrbuch der Cellulosechemie" as based on the work of Netthofel and of Hauser and Herzfeld, should be considered as settled. It appears, however, from the previously stated theory of Pringsheim that this problem still remains unsolved. The theory advanced by Ost also differs from that of the author, and further emphasizes the fact that hydrocellulose is not yet understood.

According to Ost, hydrocellulose is either a mixture of unchanged cellulose and decomposition products of low molecular weight, which are closely related to glucose, nor of a mixture of unchanged cellulose with dextrins and glucose. He considers it rather as a "uniform decomposition product of cellulose consisting certainly of smaller molecules than those of cellulose itself." Ost comes to this conclusion on the basis of the results of acetylation and of the viscosity values of copper-oxide-ammonia solutions. Without going into the details, it appears that the arguments presented by Ost are not sufficient, all the more so because they do not take into account the convincing statements of Netthofel and of Hauser and Herzfeld.

Further proof of this question must, first of all, make clear the individualities of oxy- and of hydrocelluloses. As has been previously mentioned, cellulose is only slightly acted upon by reagents and the resulting progressive reactions are not clearly defined. After a definite time of reaction, part of the cellulose will be attacked only a little or not at all; with too long a reaction period, the effect goes beyond the limits of the reaction products desired. Then the whole reaction product must be considered as not uniform and the unchanged or only slightly changed cellulose, together with the oxidation and decomposition products of low molecular weight, must be separated out of the entire reaction product. A practical example is the extraction with dilute sodium hydroxide solution or other alkalies. In the case of oxycellulose, the so-called "typical" oxycellulose is dissolved. This product precipitated by acid shows the properties of oxycellulose to a more marked degree. Work is being carried on along this line in the author's laboratory, and in this manner a more suitable and at the same time a more pure product is being prepared for further investigations.

Bearing in mind the theory of Pringsheim, the oxycellulose problem is seen to be closely related to the ideas which have been presented concerning the synthesis and the constitution of cellulose. Herein lies the most extensive and the most difficult problem in cellulose chemistry. During the past year a whole series of constitutional formulas for cellulose have been advanced, and each formula has been maintained by its author as the only correct one. We are still very far from a satisfactory solution of the problem. During the past years, however, ideas have changed considerably concerning the cellulose molecule, and no doubt future work will lead to its solution.

In particular the problem depends upon the consideration as to whether the union of the cellulose units is brought about by condensation or by polymerisation. It is an undisputed fact that cellulose can be decomposed to molecules of glucose; at the same time these molecules can be split off from cellulose yielding two molecules combined in a glucosidic manner, as cellobiose. But how glucose molecules are attached in cellulose, and whether the problem relates to these molecules or to cellobiose molecules is yet an open question. It seems, however, that the simple principle of condensation must be abandoned since the conception of the chain formula results in a large number of glucose or cellulose groups being united with a loss of water and since this idea harmonizes only with much difficulty with the changes which cellulose undergoes by the most varied treatments. This also agrees with the recently published researches of Curt Hess in which a significant reduction of the cellulose molecule appears through acetolysis of ethyl cellulose, which was prepared under special conditions without which aldehyde groups would be rendered active. The resulting product no longer possessed the colloidal character of the raw product and had a molecular weight of only 800 to 900. Now it may be possible through a substitution of the hydroxyl groups of cellulose by other groups to bring about a depolymerisation of the large cellulose molecule. Thus a decomposition, (hydrolysis), in the chemical sence, may be avoided. From these researches of Curt Hess, it might be concluded that the principle according to which the fundamntal units of the cellulose molecule are arranged is one polymerisation; yet the question remains whether these units should be represented as anhydroglucose or, what is more probable, as anhydrocellobiose.

The previously mentioned depolymerisation product of cellulose consists, according to Hess, of at most four glucose residues, a fact which Herzog and Polaniy have established by means of a Röntgen-ray spectographic method; yet there is a tendency toward association, that is, the molecule is larger.

It has not yet been disproved that, by means of further experiments with cellulose, this polymerisation product may be discovered. The action of cold, concentrated sodium hydroxide solution and the brief and quickly checked action of cold, concentrated sulphuric acid leads to a cellulose product which is only physically changed. Such products, moreover, which have been known for a long time as mercerised cellulose, might contain the depolymerisation product of cellulose. Thus the old problem of mercerised cellulose apperas in a new and promising phase.

The question whether the depolymerisation product of cellulose is still further depolymerised has not yet been determined. The author believes that it is possible that the union of four glucose residues forms the fundamental unit of the cellulose molecule.

Based on the modern conception of primary and secondary valences, the large cellulose molecule may be imagined as built up in such a way that the atoms of carbon, hydrogen and oxygen in the four glucose membered structures are held together by primary valence, while by recordary valence these structures of low molecular weight are combined to form the large cellulose molecule.

Polymerisation has already been applied to the problem of the constitution of cellulose. Yet early investigators, and even recent ones, have given little attention in general to the constitution of the fundamental cellulose molecule, either anhydro-glucose or anhydro-cellobiose. Thus there are the cellulose formulas of Gross and Bevan, of Green, of Vignon, recently of Pictet, and very lately of Hibbert. All of these give $C_6H_{10}O_5$ as the fundamental molecule (unit), a structure, whether of a cyclo-hexanon derivative, or of a kind of anhydride, which gives glucose, $C_6H_{12}O_6$, on hydrolysis.

In a discussion of these different structural formulas, which assume anhydro-cellobiose as the fundamental molecule, the ground is very uncertain and speculation too common. Wherever there are problems, there is also speculation, but it would be better to omit speculation if the desire for knowledge is to be gratified.

AMERICAN NEWSPAPER PUBLISHERS OPPOSE DUTY

The newspaper publishers of the United States, convening last week at the Waldorf-Astoria Hotel, New York City, went on record as opposing any duty on importations of sulphite pulp or upon wood or forest products entering into the manufacture of newsprint.

The question of tariff on newsprint and ingredients used in its manufacture came up incidental to a report submitted by the association's committee on Federal laws which said that in spite of its efforts, on April 11 the Fordney tariff bill was reported out leaving newsprint and ground wood pulp on the free list, but placing a 5 per cent. duty on chemical pulp.

After hearing the report of the committee the publishers adopted a resolution declaring their opposition to the proposed duties and directing that the committee continue its fight to have chemical pulp placed on the free list.

The resolution said that inasmuch as "a tariff on one of the principal constituents of newsprint is threatened by the tariff bill now pending in the Senate, and that the supply thereof in the United States is limited and totally inadequate for domestic demands," the publishers considered it necessary to oppose the proposed duty on sulphite pulp. The publishers said also that all the contentions put forth in defense of keeping newsprint on the free list were applicable in equal force in opposing any duty on chemical pulp. "The duty recommended by the Senate committee can only result in a correspondingly increased paper price," said the report dealing with the proposed legislation."

The annual gathering, which drew about 1000 newspaper and magazine publishers to the Waldorf, brought a number of live and important topics up for discussion, including talks and recommendations bearing upon labor problems, taxation, postal rates, paper supply problems and advertising rates. As was the case at the recent paper manufacturer's convention, the general tone of the talks was optimistic. The publishers take the view that business generally is improving—slowly in some spots, but nevertheless improving. In some sections the recovery is more rapid than in others, but the advertising barometer shows steady movement.

Equipment and machinery manufacturers displayed their products either through actual exhibits or by means of prepared printed material which explained them. The rooms in which these were shown were much more crowded than had been expected.

Mr. T. R. Williams of the Pittsburg **Press**, the retiring president of the Association called upon publishers to eliminate waste in newspaper plants of the country and to "scrap jealousies and animosities." He declared that the full weight of the American Newspaper Publishers' Association is against any effort to introduce the forty-four hour week into newspaper shops. In the business re-adjustment of the country, greater production rather than cutting of wages is needed, said Mr. Williams. He also asserted that there can be no reduction in newspaper advertising or subscription rates at this time. A call for the revival of the Association's conservation committee was made by Mr. Williams. He urged an aggressive campaign against waste in the handling of newsprint, freight, standardization of roll lengths, weight of paper, press-room waste, core waste, etc. "It is safe to say," he declared, "that millions of dollars are wasted annually through lack of proper study and attention to these subjects."

Will H. Hays, former Postmaster General and now chief adviser to the motion picture producers of the country, was the guest of honor at the banquet, held on Thursday night in the Hotel Commodore. Mr. Hays gave a talk on the matter of directing public opinion, both in the newspaper field and in the one with which he has recently become identified.

On the subject of the open shop the convention adopted a resolution calling for the organization of a division of the Association, to be operated without opposition or prejudice to any other department of the organization and to which publishers who wish to establish and maintain open shop conditions in their mechanical departments may turn for aid. Three representative members of the Association were appointed to formulate a plan for the operation of this division. They are D. D. Moore of the New Orleans **Times-Picayune,** Harry Chandler of the Los Angles **Times** and W. A. Elliott of the Jacksonville **Times-Union.** Earl J. McCone, secretary of the Open Shop Association, a separate organization formed at the 1921 convention of the publishers' association, told the publishers that more than 200 newspaper plants are operated as open shops, and about 160 of these have been members of the Open Shop Association. "We want to make it clear that our association is not a strike-breaking organization," said Mr. McCone. "We do not help paper having trouble with unions over wage scales."

The new president of the American Newspaper Publishers' Association is Paul Pattersoon of the Baltimore **Sun,** who has been Vice-President for the last year. He succeeds T. R. Williams of the Pittsburg **Press,** who automatically becomes a member of the Board of Directors. S. E. Thomason of the Chicago **Tribune** was elected Vice-President. John S. Bryan of the Richmond **News-Leader** was re-elected Secretary, and Howard Davis of the New York **Tribune** continues as Treasurer.

British Trade News

From our London Correspondent.)

London. April 25, 1922. - The acquisition of the consolidated ordinary shares of Alex. Pirie and Sons, by Wiggins, Teape and Co., (1919), has been approved by the shareholders of the two companies. The names of these two concerns have enjoyed a high reputation in the selling market for paper in the United Kingdom.

Not so Bad as it Looks

The balance sheet of the North of Ireland Paper Mill -notable for newsprint production shows a loss on working account, after charging depreciation and crediting repayment of excess profits duty, of £57,124. The debit balance carried forward for 1922 is £34,607. The Imperial Government, however, owes the company over £30,000 in cash in respect of excess profits duty which the mill was compelled to pay. Part of this sum has since been received, and the balance is expected shortly. The position of the mill is consequently much better than the balance sheet shows. Incidentally, I might mention that this is a case of killing industry by taxation. Through a rotten Government system a company running a mill cannot strike a balance sheet without a reference to overdue excess profits duty. When they do strike the balance sheet the money earned by the company in a time of prosperity is handed back in doles, after endless trouble. The Government is really bolstering up trade with one hand and cutting the throats of the manufacturers with the other, by means of unbusiness-like and excessive taxation in a "Free" country.

Serious Time Ahead

Millowners, pulp men, and sellers of paper in the United Kingdom will, within the next month, be in a position to know how they stand in regard to Government taxation. It is admitted on all sides that the rates of income tax, corporation profits tax, and other taxation are simply throttling the progress of industry and killing private enterprise. Remove the heavy taxation, say the big manufacturers, and trade will revive. Owing to the present cost of production it is impossible to compete in the markets of the world, as papermakers are faced with low prices, few orders, and almost stationary costs. The Budget will very shortly be issued by the Chancellor of the Exchequer, in the House of Commons, and judging by the preliminary talks that are taking place on it, I fear no relief will be given to papermakers, so that they will have to face another twelve months equally as bad, economically, as the past year. The position is really serious and only those in British manufacturing circles know it.

Imports of Pulp

During March the total supplies of pulp reached 28,886 tons, compared with 20,167 tons in February, and 25,994 tons in March, 1921. For the three months, January-March, the imports are 97,249 tons, as against 105,668 tons in 1921, for the corresponding period.

Groundwood was received as follows in March: From Canada, 3,208 tons (January-March, 7,700 tons, an increase of 250 tons for the same period in 1921); Norway, 12,531 tons (January-March, 42,773 tons against 63,670 tons); Sweden, 2,427 tons, (January-March, 8,054 tons, compared with 435 tons)—a total of 18,166 tons valued at £122,089 in March as against 20,283 tons at £893,342 in March, 1921; or, 58,532 tons for the period January-March, against 71,625 tons in 1921. It will be seen Canadian pulp imports for the three months show an increase.

Bleached sulphite from Finland, Sweden, Norway, Germany, Canada, and other countries reached 1,474 tons (4,456 tons compared with 4,026 tons for the three months), while unbleached chemical rose to 8,088 tons from the same sources, compared with 4,783 tons in March, 1921 (31,762 tons, compared with 28,060 tons for January-March 1921).

Taking all raw materials into account, esparto, rags, and pulp, the imports were 42,239 tons, compared with 35,185 tons in March, 1921, and 29,890 tons in February, 1922; or, 131,820 tons for January-March, compared with 130,378 tons in the corresponding period, 1921.

Exports Increase

The exports of British paper, boards, etc., which reached 137,935 cwts. (compared with 117,201 cwts. in February and 109,551 cwts. in March 1921, show that packing and wrapping papers were in demand overseas, the shipments rising to 22,;785 cwts. (16,572 cwts. in February last, and 6,705 cwts. in March 1921fi. Printing paper, which includes increased supplies to Australia — be it noted — totalled 69,601 cwts. (56,351 cwts. in February last and 50,920 cwts. in March, 1921), while there is a material falling-off in exports of boards, cardboard and straw board. The increases in the exports are due to extra shipments of tissues, wrappings, envelopes, wall papers, and printing papers of all kinds. Although these figures show an increase, it must not be forgotten that there were moreexporting days in March than in February; but the increase on 1921 is material.

Jumps in Imports

Comparing the imports of February and March the increase for the latter month is about double but a notable feature is the absence of newsprint supplies from Canada. For the past three months Canada has not figured in the import list for a single reel of paper, whereas the Dominion has sent 24,749 cwts. of packing and wrapping papers, and small shipments of boards. Newfoundland shipments of newsprint are also small, only 10,280 cwts. being received in the three months, while Norwegian, German and Finnish supplies have about doubled in the twelve months past. The total imports of paper, boards, etc., reached 984,052 cwts. (408,793 in February; 470,118 cwts in March, 1921), and one gratifying feature is the Canadian shipments of Kraft paper for packing and wrapping.

The sources from which wrappings and packings are received are as follows: From Finland, 44,266 cwts., valued at £57,733; Sweden, 107,242 cwts., £147,823; Norway, 63,092 cwts, £85,773; Germany, 39,35 cwts., £46,026; Belgium, 6,742 cwts., £18,062; Canada, 9,475 cwts. £13,372; other countries, 24,066 cwts., £46,042—total of 294,234 cwts. in March.

In January, it should be mentioned, Newfoundland shipped 10,280 cwts. of newsprint to England.

Pulp Market

There is a feeling of hopefulness in the pulp market. Inquiries are being made, which at all events show that the market is not dead. Business is still on a hand-to-mouth basis. Just as I write, there is a holiday feeling amongst the buyers.

Prices are about as follows: Bleached sulphite, £20; Easy Bleaching, £13; Sulphite newsprint, £12.10; Unbleached soda, £11-10; sulphate kraft No. 1) £11; Groundwood (wet), £4½; groundwood (dry), £8¾. About 29 tons of groundwood (dry) have just been received from Canada.

It is stated in London that the German pulp makers have fixed prices as follows for chemical pulp: bleached (No. 1), 1,450M.; No. 2, 1,375M.; No. 1 unbleachable 1,150M.; No. 1 bleachable, 1,200M; No. 2 unbleachable 1,000M. per 100 kg. 88: 100, delivered free to the nearest railroad station.

PULP AND PAPER NEWS

The Montreal offices of the Abitibi Power and Paper Company, Limited, have been moved from the Sun Life Building to the Canada Cement Building.

Mr. Howard Smith, Montreal, has been on a business visit to the West, going as far as Winnipeg.

The film showing the operations of Price Bros., particularly in connection with the production of newsprint, was exhibited at the annual dinner of the Canadian Daily Newspapers' Association held at the Windsor Hotel, Montreal, on May 3. The film illustrated the entire process, from the forest to the press.

Congratulations to Mr. W. R. Currie, of the Dominion Paper Company, Limited, Montreal on his marriage to Miss Reta Portway, of New York. The marriage was solemnized at the Stanley Presbyterian Church, Westmount, on April 29. The honeymoon was spent in Atlantic City and New York.

Charles Walmsley and Company, Limted, of Bury, Lancashre, England, represented in Eastern Canada and in the Eastrn section of the U. S. A., by Mr. William Whyte, Montreal, have received a contract for a 228 in. Fourdrinier newsprint machine for the Belgian Industrial Company, Shawinigan Falls, P.Q.

Mr. F. Newill has been appointed general sales manager of the Dominion Engineering Works, Limited, Lachine, P.Q.

The Fort Frances Pulp and Paper Co. lost its appeal for a counter claim against western publishers for a large loss claimed as due to the supply newsprint by the company at prices less than the current price because of the operations of the Paper controller.

The patent treaty between Germany and the United States again come into full effect and force on May 8th.

There have already been a number of forest fires, one of which destroyed 3,000,000 feet of lumber, a saw mill and 2 houses. It was caused by carelessness. Most fires are. The danger this year is unusually great because of the amount of dead timber now in the woods.

Mr. Goldman of English China Clays, Ltd, is recovering from an operation.

PAPER MAKERS ACCEPT

New York, May 11. — The international Brotherhood of Paper Makers yesterday capitulated to the terms offered by the manufacturers two weeks ago, thus retaining their present wage scale, eliminating non-skilled organizations from consideration in the future wage agreements and averting a threatened strike in the industry.

A new paper jobbing house which will deal in bond, blotting, card board, book and coated paper, was opened for business May 1 in Chicago by Louis P. Dwyer and his brother, Frank J. Mr. Louis Dwyer is well known to the trade in Chicago. He was until recently identified with the Seaman Paper Company there, and before going with that concern he headed the Bargain Paper House from 1904 to 1920. The new business is being conducted under the name of Louis P. Dwyer pending its incorporation.

TECHNICAL SECTION SUMMER MEETING

Plans for the Summer Meeting of the Technical Section at Iroquois Falls, Ont., are now well under way. Their completion depends in part upon a knowledge of hwo many members are prepared to attend. The object of this circular is to invite the members to signify their intentions.

As already announced, the Executive Council has accepted, on behalf of the members, an invitation from the Abitibi Power & Paper Company, Limited, to visit the Company's mill at Iroquois Falls, Ont., on June 20 and 21.

If a sufficient number agree to attend special cars will be engaged to convey the members from Montreal and Toronto, respectively, leaving those cities on regular G.T.R. trains on Monday evenin, June 19, connecting at North Bay on the following morning, leaving North Bay via T.N. & O.R., at 9.10 a.m. and arriving at Iroquois Falls at 6.25 P.M. on Tuesday, June 20th.

Wednesday, June 21st, and Thursday morning, June 22nd, will be devoted to an inspection of the Abitibi plant.

Returning, the party will leave Iroquois Falls on Thursday, June 22, at 1.15 p.m., arriving at North Bay, at 10.30 and at Montreal and Toronto, respectively, the following morning.

Twenty-five first-class fares are required in addition to the charge of $266 for each special Pullman. The Committee hopes that enough acceptances will be sent in to justify engaging two "specials", one from Toronto and one from Montreal.

First-class return railway fare will be as follows:—
From Montreal to Iroquois Falls and return $35.95.
From Toronto to Iroquois Falls and return $28.90.

In addition, there will be a **pro rata** charge for sleeper, the exact amount depending upon the number of excursionists, which probably will not exceed $15.00.

Meals will be obtainable on the train or at the hotel at Iroquois Falls.

During the stay at Iroquois Falls ample opportunity will be afforded to inspect the Abitibi mill and power plant, which, as every one knows, are unique in many respects among newsprint mills. Mr. R. A. McInnis, general manager of the company, and Mr. R. W. Hovey, our vice-chairman, have the local branches in hand which is a guarantee that nothing will be overlooked to provide for the success of the meeting.

The Executive Coucil feels that the opportunity is one that from both an educational and a recreation standpoint no member will want to miss.

It is urgently necessary that the Committee should know as early as possible how many members will attend, since much of the detail of the arrangements depends upon the number who will participate. The Committee therefore urges you to fill out the notification card, signifying intention to attend or otherwise, and to mail the same to the Secretary, 701 Drummond Building, Montreal, **immediately**.

Let your religion be seen. Lamps do not talk, but they shine. A lighthouse sounds no drum, yet far over the waters shines its friendly light.—**Spurgeon.**

Technical Section

REVIEW OF RECENT LITERATURE

A-3 Nettles and Ramies as Paper Making Materials. CH. GROUD. **Papeterie**, xliii, 829-830, (Sept. 25, 1921). A brief description of nettles and ramies and of their suitability as a raw material for paper Making. -A.P.-C.

A-3 Bamboos and Sorghums as Paper Making Materials. CH. GROUD. **Papier**, xxiv, 341-344, (Aug. 1921). Outline of the geographical distribution of many of the varieties of bamboos and of their respective paper making qualities, and also of sorghum (**Sorghum halepense**, Johnson grass.). -A. P. -C.

A-3 The Utilization of Bamboo for Paper Making. Bull. of the Imperial Institute, xviii, 403-427, (July-Sept. 1920); **Chimie et Industrie**, vi, 213, (Aug. 1921). A study of the general characteristics of bamboos and of their habitats. The various species are enumerated and their geographical distribution given (320 in tropical Asia, of which 136 are in British India, 170 in South America 40 in Japan, 30 in the Philippines, 24 in Africa, 5 in Madagascar, etc.). The present status of the bamboo paper industry in different countries is given. The results obtained by each process are given. Bamboo can give high grade papers (for lithographic work, etc.). The yield of pulp is 40-45 per cent, i.e., 2.-25 to 2.50 tons of dried stems furnish 1 ton of dry pulp. It is estimated that in the Philippines 14.25 tons of dried stems can be produced per acre. The article discusses the proper culture of bamboo and the proper conditions under which a bamboo pulp mill should be established. -A. P. -C.

A-7 Specifications for Limestone and Lime for Sulphite. Pulp and Paper, xix, 977-978, (Sept. 22, 1921). Tentative specifications suggested by the U. S Bureau of Standards for both calcitic and dolomitic limestone and lime for the preparation of sulphite liquor, covering definition, quality, composition, impurities, packing, marking, sampling, testing, and retesting. A. P. -C.

B-2 Strong Plea for Reforestation. Paper, xxix, 13-14. (Sept. 14, 1921). The American Paper and Pulp Association has issued a report analyzing the condition of the American pulp industry and showing the urgency of reforestation. -A.P.-C.

B-2 Volume Increment on CutOver Pulpwood Lands. E. F.McCARTHY and W. M. ROBERTSON. **J. Forestry**, xix, 611, (Oct. 1921). Presents a method of study of cut-over lands which takes cognizance of present growth and mortality, and from these suggests a method of volume regulation. Based upon the experience of the Commission of the Commission of Conservation of Canada, in the conduct of regeneration and growth studies of cut-over pulpwood in the Eastern provinces. -C. L..

B-2 A Study of Windfall in the Adirondacks. V. EDWARD BEHRE. **J. Forestry**, xix, 632, (Oct. 1921). The results of a field study made in the vicinity of Lake Nehasane, N. Y., to determine the effect of cutting on windfall and to compare types and species as to susceptibility to windfall. From this study it is evident that a thinning of the character being made on this tract and described in the article does not materially increase the liability to windfall. Under ordinary conditions only slight damage will result and when an unusually heavy wind storm occurs the damage is shown to be practically as much in unthinned stands as in those recently thinned. Where a very heavy opening is made in the stand, however, as in the case of the hardwood type, the damage will be increased to much greater extent. Such openings should either be avoided or else the adjacent softwoods should be cut much more heavily. -C. L.

B-2 The White Pine. J. S. ILLICK. **Am. Forestry,** xxvii, 422, (July 1921). Outline of the distribution, utilization and characteristics of Eastern white pine, and of reforestation and rate of growth with particular reference to conditions in Pennsylvania. -C. L.

B-2 Reforestation that Will Pay Dividends. ARTHUR NEWTON PACK. **Am. Forestry,** xxvii, 427, (July 1921). Description of reforestation work by a large lumber company near Bogalusa, La. This company has undertaken a program which contemplates keeping its forest lands in a permanently productive condition, through the protection of natural young growth, supplemented by artificial planting where necessary. The broadcast sowing of longleaf pine seed is being carried out on a large scale, with very satisfactory results. The young trees will be protected from destruction by fire and grazing. -C. L.

B-2 The Hard Pines of the North-East. JOSEPH S. ILLICK. **Am. Forestry,** xxvii, 487, (Aug. 1921). The distribution, characteristics, and utilization of northern Jack pine, pitch pine, and table mountain pine are given. -C. L.

B-2 The Pines of the South. J. S. ILLICK. **Am. Forestry,** xxvii, 551, (Sept. 1921). A description of the distribution, characteristics, and utilization of the group generally known as the Southern Pines. -C. L.

B-2 Adirondack Forest Musings. E. A. STERLING. **Am. Forestry,** xxvii, 620, (Oct. 1921). "Tupper Lake's past was founded on Softwood; its future is assured by Hardwood. The transition is gradual with the full separation still to take place. Twenty years ago hardwood was considered of little value, with efficient logging methods still to be developed. Then through the vision of a man trained a as forester in European schools and theory, a slack cooperage plant was established at Tupper Lake, which was the first extensive hardwood utilization plant in the Adirondacks, if not in the whole Northern forest, and his object in starting the plant was to get rid of the hardwoods so that a softwood forest could be planted in their place." The forestry situation in the Adirondacks and the planting work which is being undertaken in that region is discussed in a general way. -C.L.

B-2 Philanthropy or Efficiency. ARTHUR NEWTON PACK. xxvii, 642, (Oct. 1921). A discussion of the practical application of forest engineering, with particular reference to the handling of pulpwood lands. -C. L.

B-3 Safeguarding the White Pine Crop. SAMUEL B. DETWILER. **Am. Forestry,** xxvii, 7, (Jan. 1921). The substance of the conclusions reached by the Sixth Annual International Blister Rust Conference held at Boston, Mass., is that white pine can be protected from serious damage by the blister rust, but action must be prompt. Experiments begun in 1916 demonstrate that this disease is effectivedy controlled locally by destroying wild and cultivated currants and gooseberry bushes within 200 to 300 yeards of the pine. -C. L.

B-4 Wooden Shingles or Substitutes. ARTHUR NEWTON PACK. **Am. Forestry, xxvii, 231, (April 1921).** The article discusses the source of supplies of wooden shingles, methods of manufacture and their merits in comparison with other classes of roofing material. The fire hazard from the use of wooden shingles is discussed in a very fair way. Rather than forsake the use of wooden shingles, in settled communities, the enactment of simple regulative ordinances governing their use would appear effective. Fire resistant paint and stain for wood are now quite generally sold, combining with the fire retarding qualities the most artistic color effects. A regulation requiring such treatment of shingles has been suggested as a result of various practical tests. The law might go further to control the specification as to the kind of nail to be used. Experience has shown that a properly nailed shingle will not fly off, even when ignited. A wooden shingle is the only roofing which will continue to keep out water for years after its most practical life has gone, and after it has so seriously dried and cracked that a person in the attic may see daylight through a hundred fissures. The temptation is to leave the old shingles on until the roof actually begins to leak, and there is where the fire risk becomes greater. Where many houses are built close together, there might well be an ordinance governing inspection by the fire authorities to determine when this condition really becomes a public danger. -C. L.

B-4 Home Building and Wood Preservatives. ARTHUR NEWTON PACK. **Am. Forestry**, xxvii, 575, (Sept. 1921). -C. L.

B-7 Treatment of Trees as Forest Crops for Pulp Wood. Paper, xxix, 15-16, (Sept. 14, 1921). The American Forestry Association urges the treatment of forest lands so as to give regular crops to ensure a permanent supply of pulp wood for the pulp and paper industry.-A. P. -C.

B-8 Grazing Practice on the National Forests and its Effect on Natural Conditions. CLARENCE F. KORSTIAN, U. S. Forest Service. **Scientific Monthly**, p.275, (Sept. 1921). Describes briefly how grazing on the National Forests in the United States is regulated with a view to preserving the forest cover which regulates the flow of streams and to using the forage resources to the fullest extent consistent with the protection, development and use of the resources. Overgrazing frequently results in packing the soil, decreases its power of absorbing and holding precipitation, and causes the partial or complete destruction of the ground cover. Grazing the depleted range only after seed maturity and later applying this practice in rotation to all other parts of the range favors the restoration of desirable conditions. Regulated grazing is an important factor in reducing fire hazard, through removal of inflammable grass and other vegetation. -C. L.

B-9 Forest Taxation. W. G. HASTINGS. **J. Forestry** xix, 652, (Oct. 1921). The author advocates the taxation of non-agricultural forest land, on their ability to produce timber, the taxation of the growing crop to be deferred until the crop is mature. -C. L.

B-9 . Spain and her Scanty Forests. NELSON C. BROWN. **Am. Forestry,** xxvii, 135 (March 1921).-C.L.

B-9 Forestry in Pennsylvania. Am. Forestry, xxvii, 459, (July 1921). A report of the meeting of the Pennsylvania Forestry Association, Pittsburg, June 16 and 17, 1921. The original forests of Pennsylvania have almost entirely disappeared. Because of this it is estimated that the people of Pennsylvania are losing not less than $100,000,000 a year, for lumber which has to be bought outside the state, for freight on the lumber and for loss of wages paid to labor, in addition to the annual loss in forest fires, loss by destructive freshets, the closing of wood working industries, etc. The forests of Pennsylvania now produce only about one-ninth of the lumber requirements of the state. With an adequate forest policy Pennsylvania could produce all the lumber required for home use and still have a considerable volume for sale to other states. -C. L.

B-9 The Present and Prospective in Forestry. FILIBERT ROTH, **Am. Forestry**, xxvii, 647, (Sept. 1921). A description of the present forestry situation in the United States and the legislative needs, with particular reference to bills now pending in the United States Congress. Interesting references are made to what is being done on forestry lines in a number of the European countries. -C. L.

B-9 Forestry Legislation. GEORGE OSTRANDER, President of the Empire State Forest Products Association. **Paper,** xxviii, 17-19, 28-29, (Aug. 17, 1921). Ostrander discusses and criticizes the Snell bill on the ground that it gives too large and ill-defined power to the Secretary of Agriculture and the Forest Service. Forestry legislation should be based on the following principles: (1) Adequate protection to prevent the destruction or injury of standing forests by fire, the burden of such protection to be shared by the public and the owner of the land; (2) Extension of public ownership, especially of protective areas and cut-over and denuded lands, by both Federal and State purchases; (3) Reforestation on public lands and liberal inducements to owners to reforest private lands; (4) Forest surveys and the classification of lands suitable for forest production; (5) Forest perpetuation and renewal with public assistance, commensurate with the public benefit, of all burdens imposed on the owners of private timberlands. A. P. -C.

D-4 Seasoning PulpStones. Paper, xxix, (Sept. 7, 1921). A brief explanation of the importance of the proper seasoning of pulp stones, with a brief description of the characteristics of a good pulp stone. -A. P. -C.

D-0; R-5 The Manufacture and Consumption of Mechanical Wood Pulp in France To-Day and To-Morrow. G. FRESNAYE. **Papier**, xxiv, 394-395, (Sept. 1921). A discussion of the possibility and probability of expansion of the mechanical wood pulp industry in France. -A. P. -C.

F-4 The Cottrell Electric Precipitation Process. Application to the Pulp Industry. I. LAZENNEC. **L'Age de Fer**, xxxvii, 1212-1215, Sept. 25, 1921). A very brief outline of the principle of the Cottrell process and some of the various chemical industries in which it is being used (mainly in the U. S.). Amongst other applications, it is mentioned that a Quebec pulp company (not named) uses it for precipitating the dust in the gases from its soda recovery plant. It recovers daily nearly 6.5 tons of dust having the following composition: sodium sulphate 81.6 per cent, sodium carbonate 2.1 per cent, sodium bicarbonate 7.6 per cent, carbon 8.7 per cent. -A. P. -C.

K-7 Working of the Jones Pulp Mixer. Making Paper; Pulp and Paper, xix, 956, (Sept. 15, 1921). A brief description of the Jones mixing tank for slush pulp at

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UNITED STATES NOTES

A new field will be entered in the near future by the International Paper Company when it gets ready to operate several plants producing hydro-electric energy for public sale. This will probably mean the elimination of several paper mills in the United States as the water power sites will be needed. Construction work on the first of the hydro-electric plants has been under way for more than a year. This plant, located at Sherman Island, near the source of the Hudson River, should be in operation in the early part of 1923 with an initial installment of 20,000 horse-power. It was intended originally that the plant should furnish power to adjacent mills, but it was decided later to increase the capacity and sell additional power. Contracts have been made already for the sale of electric energy from this plant, which will cost more than $3,500,000. The company will not reduce its paper tonnage, but as paper can be manufactured cheaper in Canada, the mills there will be operated.

According to the monthly survey of the Department of Commerce, newsprint production showed a marked increase for the Month of March. The total for the month was 117,507 tons, the largest since January,1921. Shipments were slightly less than production, with a consequent small increase in stocks. There was a slight rise in the average spot price for the first time in many months. Contract prices of both domestic and foreign news print were relatively steady. Exports showed a marked increase.

The Union Bag and Paper Company in a notice to holders of its first mortgage 5 per cent. gold bonds has decided to redeem the issue on July 1 by paying to the Equitable Trust Company, of New York, trustee, accrued interest on all bonds and 105 per cent. of the principal.

One of the reasons Finnish paper and pulp mills have been able to keep operating at capacity last year and the early part of the present year may be attributed to the large volume of orders, not only from America, but from several European countries as well. During March, according to New York importers of the Finnish products, orders from the United States were being received in such volume that, in some cases, the mills in Finland were compelled to decline American orders because they could not contract over the long periods desired. France, Holland and Denmark were buying paper energetically in March, it was reported, although in relatively small quantities compared with the United States. England, which is usually a large customer of Finnish paper mills, during the same period was, oddly enough, holding back conspicuously in her orders. Certain interests in Finland, it is said, are now advocating an export prohibition on pulpwood. The effectiveness of the Canadian pulp wood embargoes in stimulating the pulp and paper industry in Canada has apparently been noted and the desire has followed in Finland to emulate the Canadians. The Managing Director of the Central Association of the Finnish Wood Working Industries is advocating the removal of the Finnish duties on wood products, especially that on cardboard, because of the heavy decrease in the exports of cardboard from Finland during the last year.

In a recent report of the United States Public Health Service, overheating in air conditioning in factories and mills is cited as one of the most objectionable as well as the most prevelant of workshop evils. This, it is stated, occurs most commonly in ordinary window ventilated working quarters where there is no marked overcrowding and no special manufacturing process tending to overheat or vitiate the air. All that is needed to control the evil in such places, it is pointed out, is common sense regulation of the artificial heat supply, the use of windows for ventilation before and during shifts, and intelligent attention given to the thermometer. Heat hazards of high degree cannot be summed up so simply. In cool weather, the report says, they are adequately controlled by properly designed and operated systems of fan ventilation, but in the summer time, though they can be mitigated by ventilating systems that produce vigorous air movement, they cannot be fully controlled except at prohibitive expense and must, therefore, in general, be accepted as an unavoidable incident of the employment. The effects, however, may be minimized by short spells of work alternating with rest periods.

In three New England States and in Pennsylvania and New Jersey forest fires wrought considerable damage last week. Many thousands of acres of forest tracts were levelled and the loss to other property represented thousands of dollars. While some of the conflagrations stubbornly resisted the fire-fighters, most of them, at last accounts, have either been put out or checked. In addition to the property loss there was a fatality to a child in a brush fire in the Pawcatuck Valley, Rhode Island. This fire later spread to timber, levelling many acres of valuable growth. Two deaths occurred also in Massachusetts, due to devastating fires in that State.

Proceedings pending before customs officers based on a finding that tissue paper from England was being dumped on the American market will be discontinued according to an announcement made under signature of Assistant Secretary of the Treasury Elmer E. Dover. The announcement is as follows: "Further developments satisfy the department that the industry of making tissue paper in the United States is not being, and is not likely to be, injured by reason of the importation into the United States of tissue paper from England."

A feeling prevails among paper workers in Watertown that there will be no strike in the mills of the section operating under wage agreements which are now being disputed. It is thought that the skilled workmen are not very much in favor of a strike and that they will accept terms. And the unskilled classes, it is believed likely, will be employed under the wage scales prevailing in the mill towns. If they decline to accept the terms of the manufacturers and strike, the unskilled workmen face a situation said to insure certain defeat because of the large supply of common labor available.

Mr. R. O. Sweezey, of the financial firm, Newman, Sweezing & Co. left Montreal Wednesday for a business trip to Nova Scotia.

the Camas plant, which is used instead of beaters for mixing groundwood and sulphite stock in the manufacture of news print paper. -A. P. -C.

K-8 French Dyes for Coloring Paper. LHOMME and ARGY. **Papeterie,** xliii, 511-514, 554, 692-699, 782-786, (June 10, 25, Aug. 10, Sept. 10, 1921). A list is given of a large number of colors put out by the "Compagnie Nationale des Matieres Colorantes et de Prduits Chimiques" for the coloring of paper, together with the corresponding names under which the most important German firms put out the same or similar colors. -A. P.-C.

K-10 Rosin Sizing. FRANO. **Monit. Papeterie Française.** lii, 443-444, (July 15, 1921); 481-482, (Aug. 1, 1921); 505-507, (Aug. 15, 1921); 541, (Sept. 1, 1921). Translation by A. Papineau-Couture in **Paper,** xxix, 9-15, (Dec. 7, 1921). A review of the theories of Wurster and Sembritzki on the mechanism of rosin sizing and of their application in the paper mill. -A. P. -C.

K-12 Moisture Contents of Paper During Formation. Pulp and Paaper, xix, 877, (Aug. 25, 1921). The moisture and fiber contents of the sheet are given at various points of a given news print machine operating under conditions which gave a perfectly pressed and evenly dried sheet which "showed perfect tests in every way". -A. P. -C.

K-12 Hints on the Care of Drier Felts. Papeterie, xliii, 781, (Sept. 10, 1921). Steam should be shut off from the driers when the machine is shut down. When the machine stops, the felt should be loosened, and then gradually tightened when the machine starts up again. The section of the driers nearest the winders should be supplied with a felt drier. Care should be taken that the felt is put on straight and is under even tension across the whole width. The bearings of all the felt rolls should be frequently inspected to see that there is not excessive wear. -A. P. -C.

K-12 Moisture Contents of Paper During Formation. JOHN W. BRASSINGTON, Port Arthur Shipbuilding Co., **Pulp and Paper,** xix, 877-879, (Aug. 25, 1921). Results of a series of tests carried out to ascertain the distribution of water on a Fourdrinier machine making an ordinary machine finished printing pper, the fibrous stock of which consisted of sulphite, groundwood, and about 15 per cent. of esparto pulp, and which was loaded with China clay. The quantity of water removed at the different points of the paper machine must vary according to the handling of the machine. -A. P. -C.

K-19; K-23 Ivory Paper for Memo Pads. Rev. Chim. Ind.; Papier, xxiv, 348, (Aug. 1921). Ordinary writing paper is moistened and then coated with an emulsion consisting of gelatin 12 g., kaolin 2 g., potassium dichromate 0.65 g., water 30 cc. When the coat is dry, the paper is cut to suitable size. Pencil takes well on this paper, and the marks are esily erased. -A. P. -C.

M-4 The Use of Ball Bearings in the Paper Industry. Papier, xxiv, 346-348, (Aug. 1921). Brief discussion of the merits of ball bearings on paper machines. -A. P. -C.

R-1 The Paper Industry in Russia. RAFAEL FORSS. **Pappers Travaru och Industritidskrift for Finland; Papier,** xxiv, 351-353, (Aug. 1921). Analysis of the present status of the paper industry in Sovietic Russia. -A. P. -C.

M-0 Elimiation of Waste in Industry due to Poor Lighting. WARD HARRISON, Illuminating Engineer, National Lamp Works, Nela Park, Cleveland, O. **Chem. Met. Eng.,** xxv, 407-409, (Aug. 31, 1921). Industrial accidents and resulting wastes of man power as well as costly losses of time, materials, and production, can often be avoided by the installation and proper maintenance of adequate illumination. -A. P. -C.

N-4 Elimination of Waste and Nuisance in Smoke, Fume and Gas. P. E. LANDOLT, chem. Engineer, Research Corp., New York City. **Chem. Met. Eng.,** xxv, 428-432, (Aug. 31, 1921). Supression of industrial waste by-products is essential not only to avoid economic loss but to abate nuisance in residential localities. Methods originally developed for metallurgical processes find application in a wide variety of industries. -A. P. -C.

N-5 Automatic Stokers. H. DROUOT and F. VERDEAUX. Technique Moderne, xiii, 337-343, 376-383, (Aug. and Sept. 1921). A description of the various types of automatic stokers together with a brief description of their merits and the conditions under which they give best results. -A. P. -C.

R-1, A National Frnch Paper Industry. Papeterie, xliii, 770, (Sept. 10, 1921). A brief discussion of the possibility of manufacturing in France part or all of the paper pulp which is at present imported. -A. P. -C.

..**R-1 The Paper Industry in Canada.** CH. GROUD. **Papier,** xxiv, 390-394, (Sept. 1921). A. discussion of the paper industry in Canada in 1918. -A. P. - C.

R-1 Location as a Factor in Eliminating Industrial Waste. VICTOR V. KESLEY, Assistant Works Manager, Corning Glass Works, Corning, N. Y. **Chem. Met. Eng.,** xxv, 401-402, (Aug. 31, 1921). The main factors to be considered in the proper location for industrial plants are: The influence which the proposed industry will have on the community, raw materials, transportation, labor supply, and power. -A. P. -C.

R-3. Purchasing. A.B. JOHNSON, Purchasing Agent, Pejepescot Paper Co. **Paper,** xxviii, 17-19, 28, 38, (July 13, 1921). Discussion of the various functions of a purchasing department, and of the best means to be taken by the purchasing agent to properly fulfill them. A. P.-C.

R-4 The Long Price List for Paper. ROBERT J. HAUSAUER, President Buffalo Typothetae. **Pulp and Paper,** xix, 947-949, (Sept. 15, 1921). Address delivered at the Second District Typothetae Convention, discussing the "long price list" for paper and showing that the printer is entitled to favored classification because of the service he performs in the merchandizing of paper. -A. P.-C.

R-4 "Why-nots" of the Long Price List for Paper. Pulp and Paper, xix, 950-952, (Sept. 15, 1921). A discussion of the long price list for paper, giving the reasons why the National Paper Trade Association of the United States has declared itself opposed to such a method of pricing and refuting the arguments of the typothetae in favor of the long price list. -A. P. -C.

R-9 Wastes in Litigation. WELLINGTON GUSTIN, Member of the Chicago Bar. **Chem. Met. Eng.,** xxv, 423-427, (Aug. 31, 1921). Losses arising from litigation is a potential factor in the success or failure of any industry or business. Lack of knowledge of technical terms and standards on the part of the courts is a strong argument for the establishment of arbitration courts within the industry. -A. P. -C.

R-9 Spanish Customs Tariff. Pulp and Paper, xix, 923-925, (Sept. 8, 1921). The Spanish tariffs on paper and manufactures thereof are given with a few brief explanatory notes. A. P. -C.

R-13 Meeting of the Cellulose Section of the American Chemical Society. Paper, xxix, 11-13, (Sept. 14, 1921). Abstracts of the papers presented at the Cellulose Section of the American Chemical Society, at the Convention held in New York, Sept. 6-10, 1921. -A.P.C.

The Markets

CANADIAN TRADE CONDITIONS

Montreal May 9. — The brisk demand for newsprint continues, with the mills producing at capacity. While the heavier buying is due to two or three unusual circumstances. Here is every reason to believe that the publishers in the United States and Canada will be active consumers for a considerable period. At the annual convention of the Canadian Daily Newspapers' Association, held here last week, the opinion was expressed that advertising would increase, that the prospects of larger circulations were good, and that the members of the Association would be more extensive buyers of paper. The demand outside the North American continent is also likely to be on a more extended scale. Those publishers who have had recent experience with European newsprint will not be in hurry to obtain their supplies from the same sources. A buyer from the Argentine who was in Montreal found it very difficult to secure newsprint from Eastern mills, owing to their being sold up for sometime to comes. Reports of advancing prices are premature — no action is likely to be taken for sometime.

Book and fine papers are meeting with satisfactory sales, which show a very considerable gain as compared with those at the commencement of the year. In connection with the demand of the periodical publishers for a reduction or abolition of the duty on book papers, it is of interest to note that Canadian mills have already to meet growing competition. This is illustrated by the fact that during March the imports of book papers into Canada totalled 378 tons, while those of bonds, ledgers, writings, and envelopes amounted to 100 tons. The value of paper imports in that month was $868,000, sufficient evidence that the Canadian paper trade has no monopoly. If the duties were lowered or abolished— well, the industry would stand a good chance of being swamped with imported goods, dumped here at ruinous prices. American mills have 25-40 per cent of unproductive capacity in fine papers.

The demand for Kraft papers has slackened, while the board section is quiet. There is no changes of importance in either roofing papers, waste papers or rags.

In pulps, groundwood is a slow market, with prospects of very little surplus being made by the mills while the present low prices obtain. Chemical pulps are still governed to a certain extent by European competition in the United States. Pulp from Western Canada is also competing with that of Eastern Canada mills. The orders for bleached have lately increased, although lower prices now prevail.

Taking the pulp and paper markets as a whole, there is little cause for complaint. All departments are not on the same level as regards orders, but general speak- a disposition to place small orders and to repeat as re- so disposition to place small orders and to repeat as required. This is in line with many other industries, where caution in buying is being carried out to a very large extent.

Toronto Notes

In many quarters it has been foreseen that business would be very slow gathering headway, but there have always been some who were expecting to turn the corner at any time and were prepared to meet something like a boom. These were the optimists who took nibbles for bites. Bright spots of accelerated business there have been, but these have never concerned more than one or two lines at a time and then have been only for short periods. In fact, spottiness seems fairly characteristic of all lines. There is, however, underlying the spurts some evidences of a gradual conquering of inertia, a sense that things are better. In some cases there are actually better conditions, though dealers still seem to avoid stocking up and apparently hope for lower prices. Several of our informants tell us they have exhausted their guesses, and wait, confident in gradual improvement and hopeful of pleasant surprises.

Credits are closely watched by jobbers, and no doubt the fact that manufacturers are fairly busy. while to conditions accompanying sales.

In general, business conditions are, if not actually better, at least not worse. There is being remarked the fafct that manufacturers are fairly busy, while wholesalers and retailers are comparatively quiet.

Some slight improvement is noted in fall sales, which until now have suffered from lack of confidence in conditions.

The situation is reviewed in the following market notes:

GROUNDWOOD — News grades around $30. Book $35-$40. There are indications of a little stiffening.

SULPHITE — The prices both for bleached and unbleached are nominal. Offerings in some cases indicate that concessions would be made to maintain output. News grade $60 to $65. Book grade $65 to $70. Bleached $80 to $90 delivered.

SULPHATE — Fairly steady at $70.

BOOK and WRITING — Business entering a period of quietness, especially in book.

BRISTOLS, TAGS, COVERS — Fairly active in all lines round Central Ontario. Maritime business reported slow.

WRAPPINGS — M. G. Kraft up 15c per 100 lbs. to $8.90. M. F. Kraft $8.75. Colored Kraft 9¼c to 10¼c. No. 1 Manilla 7¼c down ¼c. B. Manilla 5¾c. Fibre Manilla 7¼c. T. Manilla 5¼c.

BAG — Manilla—List less 60-20-2½-2. Heavy kraft 70-10-2½-2. Light Kraft 60-20-2½-2½-2. White 45-10-10-2½.

TISSUES —

No. 11 Manilla.	20x30	..	.80	24x36	..	1.05
Nat. White	20x30	..	.90	24x36	..	1.25
No. 1 White	20x30	..	1.10	24x36	..	1.55
Nat. or No. 1 Manilla Sulphite	20x30	..	1.00	24x36	..	1.40

TOILETS — List less 20% and 25% in car lots.

TOWELS — Interfolding $5.63 per case, in car lots. Roll (150 per roll, 50 rolls to case). Bleached white $22.00 per case. Natural white $19.00 per case. No. 3. $13.75 per case. — Less 22 per cent.

PAPER STOCK —

No. 1 Hard White Shavings	$3.75
No. 1 Soft White Shavings	3.20
No. 1 Heavy Books and Magazines	1.50
Ledgers and Writings	1.85
No. 1 Kraft	2.25

Newspapers	.80
No. 1 Mixed Papers	.60
Miscellaneous Mixed Papers	.55
No. 1 White Shirt Cuttings	9¾ to 10c
Fancy Shirt Cuttings	4¾ — 5c
Canton Flannels Bleached	7½ — 8c
White Lawns	7 — 7¼c
Blue Overall Cuttings	5 — 5½c

One dealer reports that "there seems to be a slightly better demand for most grades of New Cotton cuttings, especially No. 1 White Shirts. The mills have been buying from hand to mouth, and now that there is more paper being sold, a good movement in all grades of cuttings is expected".

ROPES AND BAGGING — No. 1 Scrap Bagging $17.50 per ton. No.1 Manilla Rope 5c per lb.—In good demand. Mixed Strings $22.50 per ton.

HEAVY CHEMICALS — Alum $2.75 per 100 lbs. Caustic Soda $4.35 per 100 lbs. Soda Ash—58% 2¼c per lb. Sulphuric Acid 66deg. Be. $18.00 per ton 60deg Be $15.00 per ton. Market is not vey active, prices are fairly firm.

NEW YORK MARKETS

New York, May 6 — (Special Correspondence) — The Federal Trade Commission's monthly review for March contains figures pertaining to paper production which show conclusively that the paper industry of the United States is rapidly getting back to normal, and which subtantiate the numerous reports recently going the rounds of the trade regarding the marked pickup in business in paper. During March a total of 593,860 net tons of paper and paper beard of all kinds was produced by United States mills, establishing a new high level of output for more than a year and a half. A greater tonnage by far of paper was produced in March than in any month since back in the summer of 1920, when paper mills were running at an abnormally, busy pace; for example, the increase in production in March over February of this year was no less than 92,043 net tons, while the excess production in March over that of last October when paper manufacturing was at its height for all of 1921 was 51,542 net tons. That paper production is running even better than normal is indicated by the fact that the Commission's report shows that for the past five years the average monthly output of the paper mills of the country is but 544,509 tons, which means that March production was some 49,000 tons above the average.

To say the least, these figures should give encouragement to paper manufacturers and merchants. It is doubtful whether any other basic industry in the country is making such a fine showing toward getting back to normalcy; certainly there are few which are in such a favorable position, and, what is even more encouraging, the probabilities are that during the past few weeks or since the last report of the Federal Trade Commission was compiled, the paper industry has made even further strides toward a full resumption of manufacturing activity. Reports coming from a variety of cources tell of demand for paper of nearly all kinds expanding to a very material extend; of dealers and consumers stocking up to be sure of having supplies on hand when the expected increase in their requirements develops, and of mills constantly finding it necessary to increase operations to take care of the growing demand. Sentiment in the trade is of a very bullish character. Paper produ- boom proportions during the coming fall and these are cers and merchants are talking of business assuming

HANS LAGERLOEF, President and Treasurer
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WOOD PULP

SOLE AGENTS IN U. S. A., CANADA, MEXICO AND CUBA FOR

Finnish Cellulose Association
Helsingfors, Finland

AND

Finnish Wood Pulp Union
Helsingfors, Finland

not merely idle boasts, but are based on numerous indications of what the future holds in store.

Newsprint is in a firm market position. Demand during the past few days has been quite pronounced for prompt deliveries, inteffring that publishers are laying in stocks in the fear that a strike of print paper mill workers may be called. So active has the demand been and so firm have prices ruled that there have been rumors of price advances. One rumor was to the effect that the Canadian Export Paper Company had increased its price on newsprint for third quarter deliveries $5 a ton to 3.75 cents per pound; other rumors were that domestic manufacturers were naming higher prices. These rumors have been generally denied and, as far as has been ascertained, no actual changes have occurred in newsprint prices, though it is plain to be seen that consumers are paying full quoted figures at present and that little or no supply of print paper is available at price concessions.

There is an improving situation for book paper, which is gratifying, because probably no other branch of the paper trade needs improvement more than the book paper division. Unfortunately demand for book paper has not increased in recent months along with trade and fiction periodicals printing larger issues, book paper consumption is at last rising and mills are beginning to feel the healthier position of the market. Book paper quotations are very irregular and their tone is easy, but it stands to reason that this situation will change as the movement of paper expands.

Wrappings and tissues are enjoying a comparatively good demand. Activity in the wrapping paper industry is of surprisingly good proportions considering the quantity of foreign wrapping paper that is now being marketed in the States. Looking at import figures, one would think that enough wrapping paper is coming into the country from outside sources to put a decided damper on the domestic industry, yet this is not observable among domestic mills, which are managing to get sufficient business to keep running at a good rate of capacity. Domestic wrapping paper production in March was in excess of 70,000 tons, which was 8,000 tons better than in February and 7,000 tons above the monthly average output of this kind of paper.

Fine papers are moving well and at steady prices. General business improvement is leading to a much larger consumption of bonds and ledgers, and orders that paper mills are receiving reflect this to an apparent degree. The board market is steadily broadening, and quotations are hardening. No change of note is reported in board prices, but producers are becoming firmer in their attitude and boards seem on the threshhold of an advance.

GROUND WOOD. — It is said that "figures never lie," and that the most accurate way to ascertain the position of a commodity market is through statistics. If this be the case, it would appear that mechanical pulp is in a firm market state. For example, in March, production of ground wood pumped something like 44,000 net tons above that of February, or no less than a gain of 50 per cent; notwithstanding which prices hold fairly steady and indications are that stocks are not much larger than before grinders began to increase their output. This infers that consumption of ground wood has mounted very appreciably of late and that producers therefore have not been obliged to reduce prices in order to sell their pulp.

Domestic ground wood of prime spruce quality for prompt shipment is quoted around $32 a ton f.o.b. grinding plants. Prices vary according to the distance producing mills are situated from consuming points, but sellers are said to be having no difficulty in obtaining about $38 a ton, and even higher, delivered consuming mills. There is still a good trade being accomplished in ground wood brought down to New York from Nova Scotia in schooners and sold to paper and board mills not far from this city at prices ranging around $33 a ton f.o.b. New Yrk.

CHEMICAL PULP. — Not much of an interesting character is happening in chemical wood pulp. There is a constant demand of routine nature coming from paper mills but there is also a decided unwillingness on the part of consumers to buy other than supplies directly needed with the result that most transactions involve rather small tonnage of pulp. Quotations are well maintained, and while it is true buyers are finding some lots of sulphite and kraft at what could be termed "bargain" prices, no great amount of selling pressure is being exerted by producers and importers.

News grade sulphite is moving fairly steadily at prices centering on 2.50 cents per pound at pulp mills, and domestic bleached sulphite is firmly quoted at 4.50 cents for the No. 1 grade at producing points and around 4 cents for secondary quality. Soda pulp is easy, and sales down to 3.50 cents a pound have been reported. Kraft is holding its own in price at between 2.75 and 3 cents for No. 1 domestic, and about 2.65 cents for Scandinavian kraft.

RAGS. — The tone of the papermaking rag market continues to strengthen. This seems due not to any increase in buying by consumers, but to the feeling of confidence among dealers that a broader demand and higher prices are not far off, which prompts sellers to be more wary in entering engagements covering sizeable lots of rags. Mills are mostly buying to fill immediate wants, and dealers are taking orders only for such stocks as they have ready for shipment, and the

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situation is such that there is small doubt that any broadening of demand would send prices on nearly all grades at least a little higher. Roofing rags are bringing around 90 cents a hundred pounds for No. 1 packing and 80 cents for No. 2 at dealers' shipping points; old No. 1 repacked whites are quoted at 5 cents upward a pound, repacked thirds and blues at 1.75 to 2 cents, No. 1 new white shirt cuttings at 10 cents, blue overall cuttings at 5 cents, washables at 3.75 cents, new light silesias at 5.25 cents, and new unbleached muslins at 8.25 cents.

PAPER STOCK. — Several grades of old paper are tending upward in price. Old magazines are particularly strong, and dealers, evidently expecting a brisk demand to develop shortly from consumers, are reported in some cases paying higher prices than mills are willing to grant. It is doubtful whether No. 1 heavy books and magazines can be bought out of New York at less than 1.40 cents a pound f.o.b. this city, and no big tonnage could be obtained at this price. Soft white shavings are firm, and most dealers ask 3.25 cents a pound at shipping points for No. 1 packing of this stock. Hard white shavings are relatively quiet and are selling to mills at around 3.75 cents. Old kraft paper is also largely neglected, with prices ranging around 1.65 cents for No. 1 packing, whereas white news cuttings are actively sought and freely bring 1.65 cents a pound New York. Folded newspapers are selling at 55 to 60 cents a hundred pounds and No. 1 mixed paper at an average of 40 cents.

OLD ROPE AND BAGGING. — Old rope is wanted by paper mills in fairly consistent volume and prices hold steady at around 4.25 cents per pound at shipping points on No. 1 domestic manila rope. Scrap bagging is selling at unchanged prices of one cent a pound for No. 1 packing, and at about 65 cents a hundred pounds for roofing bagging.

A NEW STEAM JOINT

The Port Arthur Shipbuilding Company has developed a special compensating steam joint for paper machine dryers and calendar rolls. The joint acts also as a safety valve and is designed for either a syphon or dipper attachment.

The Appellate Division of the New York State Supreme Court has upheld the $1,500,000 damage claim of the Sun Printing and Publishing Association, New York City, against the Remington Paper and Power Company of Watertown, N.Y. By the court's decision returned last Friday, the paper company is held accountable for the non-delivery of paper which it had contracted to supply during the year 1920. It was charged by the Sun Printing and Publishing Association that the Remington Company had carried out the contract for a time, but then declined further to be bound by it when the market price of newsprint attained unprecedented heights in 1920. When this occured the Remington Company claimed, it was alleged, that the contract was invalid by reason of a technicality. In its decision sustaining the contract, the Appellate Division reversd Supreme Court Justice Bijur, who had held it to be unenforcible.

If you will take the trouble to study and think, you will unquestionably stand out among your fellows. If you will throw yourself into your job, whatever it is, study all you see and hear, really crave a chance to use all your powers, you need not generally hunt success, for success will seek you out.—A. Barton Heuburn.

A NEW TENSILE TESTER FOR PAPER

Both manufacturers and users of paper will be interested in the new Perkins Tensile Tester, an illustration of which appears in the manufacturers' announcement in this issue. This is made by the firm of B. F. Perkins & Son, Inc., Holyoke, Mass., manufacturers of the standard Mullen Paper Tester which indicates the exact bursting strength of paper and which is used by the Governments of Canada, the United States, and Great Britain as well as by makers and buyers of paper the world over. The new Tensile Tester is of especial value wherever an accurate tensile or pull test of paper and other materials is desired.

The Perkins Tensile Tester is of the vertical type, and is hydraulically operated. The cylinder is filled with a liquid which is compressed by a solid metal plunger, which fits the cylinder with a very accurately ground and lapped fit, and has no packings to wear out or get out of order. This plunger is attached to the upper or stationary clamp by means of a stirrup which brings the pull in a straight vertical line.

The lower or moving clamp is attached to a vertical screw which is operated by means of a handwheel on the side of the machine. The pressure is indicated on a specially made standard gauge which is acted on by hydraulic pressure from the cylinder. The readings are given in pounds per linear inch breaking strength of a strip of paper or other material. The material to be tested is therefore cut into strips one inch wide.

Removable and interchangeable stop-guages are provided which automatically separate the clamp jaws one inch, two inches, or four inches apart, as desired, so that strips of these lengths may be tested easily.

The material is inserted and clamped uniformly and without side cramping by means of a device whereby the clamp jaws are held rigid during the insertion of the strip to be tested. As soon as the test begins to be made, the clamp jaws are freed so that they are on a swivel, and the strain of the material is thus taken up uniformly.

When the handwheel is turned the strip of paper under test is subjected to a direct pull. This operates on the fluid in the cylinder, which simultaneously acts on the standard pressure guage. The pointer on the guage stops automatically as soon as the material breaks, and thus accurately indicates the tensile strength of the material to the exact breaking point in pounds per inch strip, the pointer remaining stationary until it is released by pressing a button the side of the guage.

A NEW GRINDER VALVE

The Canadian Ingersoll-Rand Company has recently perfected a new type of grinder valve for controlling the movement of the hydraulic cylinder on mechanical pulp grinders. This is of the pump handle type which permits quicker and easy operation. It is designed to stand the water pressure of 100 pounds or more per square inch without leaking and is built for hard service. The minimum amount of attention will keep the valve in first class working order. The main casting is drilled so as to fit to practically any type or make of grinder and it can be mounted in any one of four positions involved.

De world owes you a livin' son, but you's got to do some work to git yohse'f identified as de feller i'ts comin' to.—Uncle Eben.

HORTON

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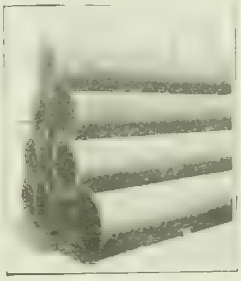

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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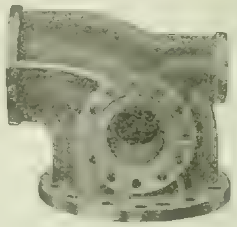

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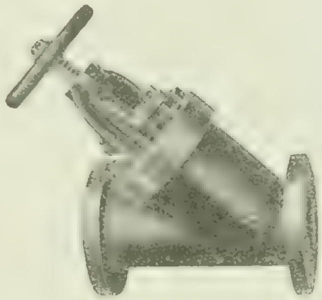

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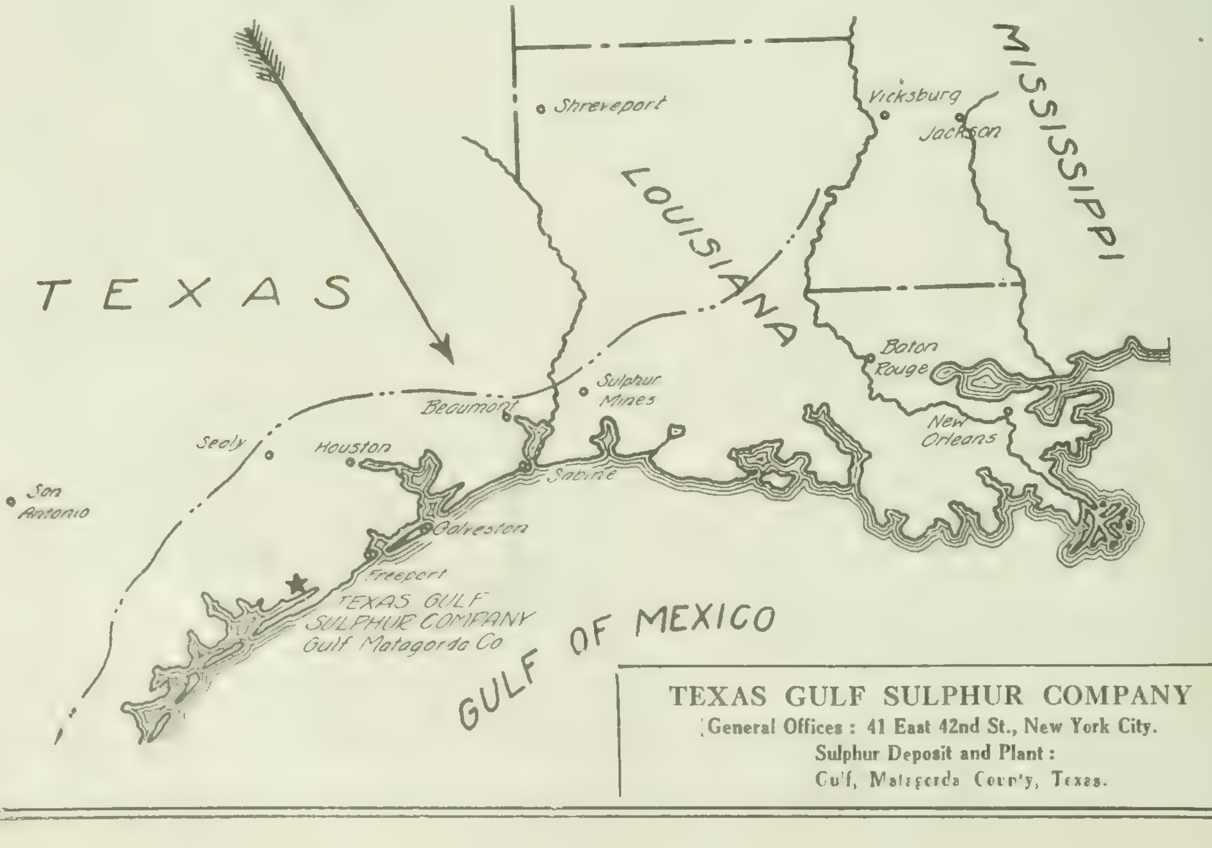

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:-: EDITORIAL :-:

DIVERTING WATER POWER

We are not greatly surprised to read of the intention of the International Paper Co. to divert some of its water powers now used for the production of pulp into other directions. That is but a natural outcome of changing circumstances with regard to both depletion of timber and growth of population with accompanying increase in demand for electric power for public service and domestic uses as well as for the increasing amount of power required for light manufacauring. Power in the United States is in many places going to be worth more for such uses than can be obtained for it when used for the production of mechanical pulp. Certainly there is little inducement in current prices of groundwood for development of hydro electric plants for groundwood mill operation. Another point which may or may not have been taken into consideration is the growing need for conservation dams to maintain something like uniform flow in the streams. The Paper Industry is not in a position to undertake such works on its own account and Governments are probably less alive to the need of doing so for the benefit of a manufacturing industry than they are for the benefit of a public service corporation and the domestic user of power in its ultimate form. The cutting away of American forests has undoubtedly been a big factor in the growing necessity for such conservation works and at the same time probably the most important factor in making the operation of the hydraulic driven pulp mill less remunerative as depletion of the forest has progressed.

With this beginning of a change in the application of hydraulic power in the States where developments were originally planned for pulp mills, we may, before long, expect to see some Canadian water powers originally developed for the same purpose, changed in a similar manner. The process will doubtless be slower because the Canadian mills are mostly in larger units and built later at a greater expense than the American mills which have in some instances been running for a long time and originally cost comparatively little. To change these over now and to put them in a condition to compete with Canadian mills would be almost out of the question, even if they had wood enough to warrant the expense. So it appears that Canadian water powers will be diverted more slowly from pulp making than the American but unless steps are taken to re-establish the forest within economic hauling distance of these mills, a change in application of the power will here also doubtless become eventually necessary.

THE SUMMER TRIP

Have you been to Iroquois Falls? Anyone connected with the Pulp and Paper Industry in Canada who has not seen the wonderful development at Iroquois Falls, brought from a state of wilderness to one of the most up-to-date and attractive towns in the Dominion, by the Abitibi Power and Paper Co., has missed a very important experience. The record of the courage, foresight, and accomplishment that can be read on every hand is sufficiently educative and inspiring to make a trip to this northern Ontario town decidedly worth while. The plans for the summer meeting of the Technical Section this year provide the most favorable opportunity for seeing the town at its best and the mill under the most favorable auspices. Canadian paper mills have been remarkably cordial and generous in their entertainment of the Technical Section during their summer meetings, which have taken the form of mill visits in order that the practical side of paper making may be kept conspicuously before the technical men and in order that members may see "how the other fellow does it". Nowhere else in the world does one find such open mindedness with regard to permitting and even encouraging inspection of mills as is extended on every hand to members of the Technical Section. This characteristic of the Canadian paper maker has been a subject of wonderment on the part of visitors from other countries where there is much of the old fashioned idea of secrecy. Fortunately, we have come to realize that progress lies not so much behind closed doors as through open minds, open plants and open discussions.

The two mills on the continent, and probably in the whole paper making world, which are at present attracting the most attention, are those of the Laurentide Company and the Abitibi Power and Paper Company. The Technical Section had the privilege last year of visiting the Laurentide plant and seeing their wonderful newsprint machines electrically driven, operating at 1,000 ft. per minute, a speed which has now been exceeded by about 10 per cent. This year a cordial invitation was extended to the Section to visit the recently completed paper mill and power plant of the Abitibi Co. Here is the largest single paper mill in Canada and possibly the largest on the continent. The production is 500 tons per day from 7 machines making newsprint in addition to which is a 30 ton machine making wrappers. Two of these machines are the largest in the world having wires 232" wide making a sheet of paper on which 3 automobiles could easily be driven abreast. The other new machine will excite interest and compliment on account of its Westinghouse sectional electric drive. The Laurentide machines are driven by the Harland Patent Interlock sectional electric drive and there are a number of machines in Canada driven by the General Electric Company's design of drive. Another feature of the Abitibi plant which will be found of exceptional interest to the technical men and should be of interest also to up-to-date mill managers, is the Service Department through whose efforts uniformity of materials and smoothness of operation has well nigh reached perfection. Tests and records are made at every critical point from the head of water at the dam to the moisture in the finished paper. We doubt if there is another plant with a finer *esprit de corps* than will be found at Iroquois Falls although our Canadian mills generally are recognised for the fine spirit of loyalty and appreciation which pervades them.

For those interested in power developments, a side trip will be organized to visit the new hydro-electric plant at Twin Falls about 12 miles from the mill. In fact the whole matter of power generation, both hydraulic and steam, is an important factor of the plant.

As the editor is on the committee of arrangements it will be best to say nothing at this time about the plans for entertainment as we don't want to reveal any secrets, but there is one point that can be mentioned, which is, that an opportunity will be given, after the inspection of the mill, for the visitors to gather in conference with the officials of the company and ask questions about what they have seen and discuss points of mutual interest suggested by the inspection of the plant. It is felt that this feature of the meeting will be distinctly worth while and will be much more appreciated than any attempt on the part of the committee to arrange for the reading of formal papers.

We have been advised by the secretary that a fair number of replies have been received but that evidently the opportunities offered by this meeting are not fully realized or appreciated and that at least twice the number should come as have at this time signified their intention of doing so. It should be clearly understood also, that the invitation is not strictly limited to members of the Technical Section but that the management of the Canadian mills and members of the Canadian Pulp and Paper Mill Superintendents' Association will be most welcome. In order that satisfactory arrangements for comfortable accommodation of those who wish to take the trip may be made, it is strongly urged that each one send his acceptance immediately to the secretary of the Canadian Pulp and Paper Association, 701 Drummond Bldg., Montreal. A further statement of plans is printed on another page of this issue.

COBWEBS

We read that Japanse interests are seeking large supplies of lumber in British Columbia, *because Japan has banned the production of lumber from native forests.* And we are exporting not only lumber but even saw logs without so much as insuring new growth! Do Canadians realize that those western trees have been growing from 100 to 400 years and that new saw timber cannot be grown in less than 50 to 75 years?

There is no soda pulp being made in Canada, since the Georgetown, Ont., pulp mill of the Provincial Paper Mills was closed. It always seemed to us that Canada should produce more soda pulp from poplar and put high grade wood pulp book papers on a basis comparable to our newsprint industry. It could be done by making a real forest policy an integral part of mill management.

The City of Montreal has passed a resolution intended to encourage tree planting.

Congratulations to the Dominion Engineering Works on their contracts for paper machines, also to Charles Walmsley Ltd. The Canadian concern has orders for two machines for the St. Lawrence Paper Mills, Ltd. (formerly Three Rivers Pulp and Paper Co.), one for the Provincial Paper Mills, Ltd. and one for Ford and Co. Port Neuf.

We had great pleasure this week in meeting Mr. John Paramor, Managing Director of the Watford Engineering Works, of Watford, near London. This firm has been making paper machinery for more than a century.

We are very glad to note the keenness and courage of the President of the Canadian Pulp and Paper Association in recognizing and proclaiming that speculation in pulp and paper securities is a real menace. As stated in these columns some five years ago, paper cannot be made on St. James St. It is time that more attention be paid to conditions of forest and less to fluctuations in stock prices.

THE FINEST CONTRIBUTION

The New York State College Of Forestry
At Syracuse University
Syracuse, N. Y., May 3, 1922.

My dear Mr. Stephenson:

I have received my copy of volume III of the vocational text-book on the "Manufacture of Pulp and Paper".

This book is the finest contribution to the literature on Pulp and Paper Manufacture which I have ever obtained and you may be assured that I shall very heartily recommend its purchase by our students. The book will be invaluable to us for, as you know, we emphasize the production of wood pulps. I beleive that you and your Associate Editors are to be congratulated on the authorship of such a valuable text book.

Very truly yours,
C. E. Libby
Professor of Pulp and Paper Manufacture.

The average man has more friends and fewer enemies than he thinks he has.

An Essay on Newsprint Paper

By WILLIAM CAULDWELL MUNRO,
Winner of the Technical Section Prize, 1922.

The writer had the pleasure of working in the plant of the Ontario Pulp and Paper Company at Thorold, which is situated on the Niagara Penninsula in the Province of Ontario, during the Summer of 1921. He was not engaged by the Company in a technical capacity, but joined a union and worked with the different repair crews in the plant, such as of the Sulphite, Groundwood, Electrical and Boiler House Departments. This course was adopted in order that some practical knowledge of the process of making newsprint might be gained so that the writer, on completion of University work, might undertake a technical position, with greater surety of success, knowing to some extent the actual conditions in the mill and understanding mill men and their difficulties better.

Situated as the plant is, in one of the best industrial districts of Canada, the writer was able to visit many different plants with their varied processes, as well as several paper mills engaged in the manufacture of news, fine, tissue, parchment and wall papers. Many pleasant and instructive hours were also spent looking over the work on the Welland Ship and Chippawa Power Canals, two great examples of the constructive courage of the Canadian people.

Timber Limits

It is necessary to present the experiences of the last two weeks of the summer first, in order that a plan of logical sequence may be followed. The writer was fortunate enough to be able to visit the timber limits of the Company on the North shore of the Gulf of St. Lawrence.

From a centralized depot on the shore of the Gulf, bushmen are sent out each fall. These men work through the winter felling the trees selected by the timber ranger, and getting them to the streams on which they are floated down to the depot in the spring.

The logs are received at the depot saw mill in from fourteen to sixteen foot lengths. They are cut by a three saw slasher into four foot lengths and then piled ready for shipment to the mill.

Loading Dock at Timber Limits.

It is an economic problem, depending upon many conditions to decide whether the wood will be brought to the mill or the mill to the wood. The Ontario Paper Company decided to bring the wood to the mill. This is accomplished by freight boats during the navigation season when enough wood is brought to the mill to carry on for the entire year.

William Cauldwell Munro, Essay prize winner.

Although many tell a different story, one has only to travel along the banks and around the shores of the rivers and lakes of our north country to realize the wonderful forest heritage Nature has given to this country of God's and ours, and that through this heritage Canada will be the pulp mill of the world for, at least, many years to come.

The Mill Yard

The wood is received at the mill in four foot lengths, with most of the bark attached. The duties of the yard are to receive the wood, convey it to and from storage and cut it into lengths suitable for drum barking.

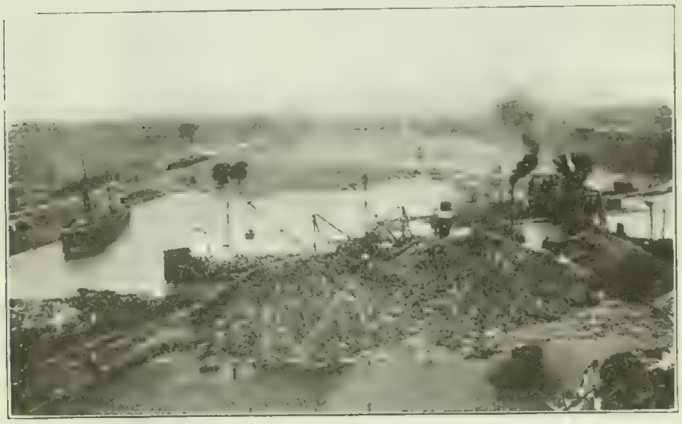
Mills which receive their wood in sixteen foot lengths save money on the cutting of it. Only one slasher with six or seven saws and its attending crew is necessary. For wood received in four foot lengths, the slasher at the limits with its crew, as well as two single saw slashers with their crews at the mill, are required.

The first mill waste of wood occurs at the saws, the amount of sawdust produced by these saws being considerable. So far the sawdust is of little value except for fuel. The saws used are of the "V" toothed circular type, and produce a fairly coarse sawdust. It might be possible, by producing a still coarser sawdust, to utilize it in the manufacture of sulphite pulp.

As it is necessary to employ men to handle the wood, the less it is handleed the better. Thought and money expended in developing an efficient system of wood handling should prove very remunerative.

The Wood Room

The purpose of the wood room is to prepare the wood for pulping and to convey it to its respective departments. Removing the bark is the only preparation required of the wood destined for ground wood pulp. The bark is removed in a drum barker by the action of the wood tumbling around in the rotating drum, which is made of "U" shaped iron bars or of sheet iron with lugs attached. A drum barker with high pressure water nozzles, from the point of view of cleanliness, removes the bark sufficiently for both news sulphite and ground wood pulps. If the wood for the sulphite is sent direct from the barker to the chipper and thence to the chip loft the chips are wet, requiring a stronger acid to cook them and necessitating the use of more sulphur. The wet chips also tend to heat.



Unloading Wood at the Mill, New Welland Ship Canal in Back Ground, Present in Fore.

Hand fed knife barkers or rossers give a very clean wood which, if brought from storage, is excellent for sulphite pulp. The loss of wood from knife barkers though, is relatively high, being in the neighbourhood of 18 per cent. If the barkers are not manned by trustworthy men the loss may run as high as 30 per cent. In drum barking the loss may be kept within 8 to 10 percent of the wood handled.

Manufacture of Sulphite Chemical Pulp

Preparation of the Wood:—A clean, dry white spruce is a great advantage in the making of sulphite because of its high cellulose content, low resins and good colour. Its fibre is long, strong, soft and pliable which gives a nice pulp.

It is a paying proposition to have separate storage piles for the wood intended to be used for chemical pulp, building these piles of extra quality spruce that comes to the mill and allowing them to season three or four months before being used.

The wood is conveyed to the mill from the piles and barked. It is then chipped in a wood chipper, the quality of the chips depending upon the care and adjustment of its knives.

These chips are screened, generally through a screen of the flat shaker or cylindrical type, and those chips which do not pass through the openings, varying in size from mill to mill, are sent through a re-chipper or disintegrator. The whole is then conveyed to the chip storage above the digesters. There are several forms of chip storages each having merits of its own depending upon opinion and conditions. A cylindrical tank of reinforced concrete is favourably looked upon because of its durability and low cost.

(To be continued.)

POWER LOOMS FOR FOURDRINIER WIRES

One of the most interesting talks the Science Club of th Abitibi Power and Paper Co. has listened to was that given by Hamilton Lindsay Wire Weaving Company of Cleveland, when he described in detail the manufacture of fourdrinier wire.

Mr. Lindsay is thoroughly competent to speak on the subject, as it was he who invented and manufactured the first power loom used in the manufacture of wire cloth. Twenty years ago he was superintendent of a machine shop, and when out in Wisconsin dropped into a place there where they were manufacturing fourdrinier wire. It was done by hand and as he watched the operation, it struck him how irregular the wire cloth was, and necessarily so. In the morning when the men were fresh the blow of reeds on the wire, which determines the mesh, was strong, so the mesh was close. Towards evening when they were tired, it was not so strong, so the mesh was more open. As it takes many days to make a fourdrinier wire, the wire when finished showed close and open weave alternating all over the wire.

He determined to try and apply power, so that the beating down of the chute wire against the warp wires would be uniform in pressure. After two years of planning, and hard work, he finally succeeded in getting a machine to work and took out his patents.

It was the first automatic power loom to manufacture wire cloth. From that time on he has been at the head of his own company, manufacturing fourdrinier wires steadily.

In spite of the years he has been at it, Mr. Lindsay has not got into a rut, but is experimenting more widely every day on new methods in order to meet the gradually icreasing speed of the paper machines.

Mr. Lindsay went thoroughly into the manufacture of the wire cloth. Only two metals were suitable; low brass, which is eighty per cent. copper and twenty per cent. zinc. This was used for the slower machines. On the first machine phosphor bronze was used, which is composed of ninety-two per cent. copper, and seven and one-half per cent. of tin, and one-half of one per cent. phosphorus.

He described drawing down the wire from three-inch ingots till it was .009 of an inch, which is the size used in the manufacture of the wire for the Abitibi machines.

In the making of the wires for Nos. 6 and 7, which are 232 inches wide, there were 5000 lbs. of this wire on the beam at the end of the loom. The manufacture of wire for No. 7 requires eight or nine days for the weaving, and about two days to finish. The finishing of the wires includes first of all, springing, to remove all roughness; stretching to insure that the tension on all wires was the same; seaming, very carefully, so that the seam will not cause any obstruction to the flow of stock; and finally, packing, which has been a considerable problem.

The curious part of the information given by Mr. Lindsay was that mice were very hard on wire either before it was woven of after and that they had to keep all wire and all wire cloth in special metal compartments which were mice proof.

The new wrapping machine of the Abitibi Power and Paper Company has been installed and is now in operation. This machine has a capacity of 30 tons of wrapper a day, 10 of which will be used in the finishing room and the balance available for market.

Water Power in the Pulp and Paper Industry in Canada

(Continued from last issue.)

TABLE No. 2 gives a list of mills operated entirely from purchased hydro-electric energy, the special reference numbers given in the first column also corresponding to those on the accompanying map as in Table No. 1. Mills purchasing power and appearing in Table No. 1 with the mark (p) have not been repeated in Table No. 2. In this connection it may be mentioned that a few of the mills listed as purchasing power could practically be said to produce their own hydro-electric energy in cases where the power plant is almost exclusively used to supply the pulp and paper mill but is operated by a subsidiary or allied organization. On the other hand we find large power organizations supplying a considerable amount of power to the pulp and paper industry. In Quebec, the Shawinigan Water and Power Company and allied organizations supply some 80,000 h.p., while in Ontario, the Hydro-Electric Power Commission and Toronto Power Company together supply some 55,000 h.p. for this purpose.

General Conditions in Each Province

The location of the pulp and paper mills in Canada shows that they are grouped according to facilities for wood, power or transportation. The various mills of the same group show certain outstanding features with regard to power requirements as a result of the class of production which characterizes the group.

TABLE No. 3 has been prepared to illustrate predominating features in certain districtsinto which our Canandian mills may be arbitrarily grouped. Perhaps the greatest contrast exhibited in this table between the class of mills found in the Niagara and Toronto, Eastern Ontario, Montreal and Quebec city groups, where a large number of mills (Column 2), whose average capacity is small (Column 6), produce much of the miscellaneous kinds of paper (Column 9), while the British Columbia and more northerly groups in Ontario and Quebec comprise mills of large capacity (Column 6), requiring much power to produce principally pulp and newsprint (Columns 7 and 8).

Motive Power by Provinces

The mode of producing power for the operation of pulp

Compiled by Dominion Water Power Branch,
February 2nd, 1922.

TABLE NO. 2.
PULP AND PULP AND PAPER MILLS IN CANADA OPERATING ENTIRELY FROM PURCHASED HYDRO ELECTRIC POWER.

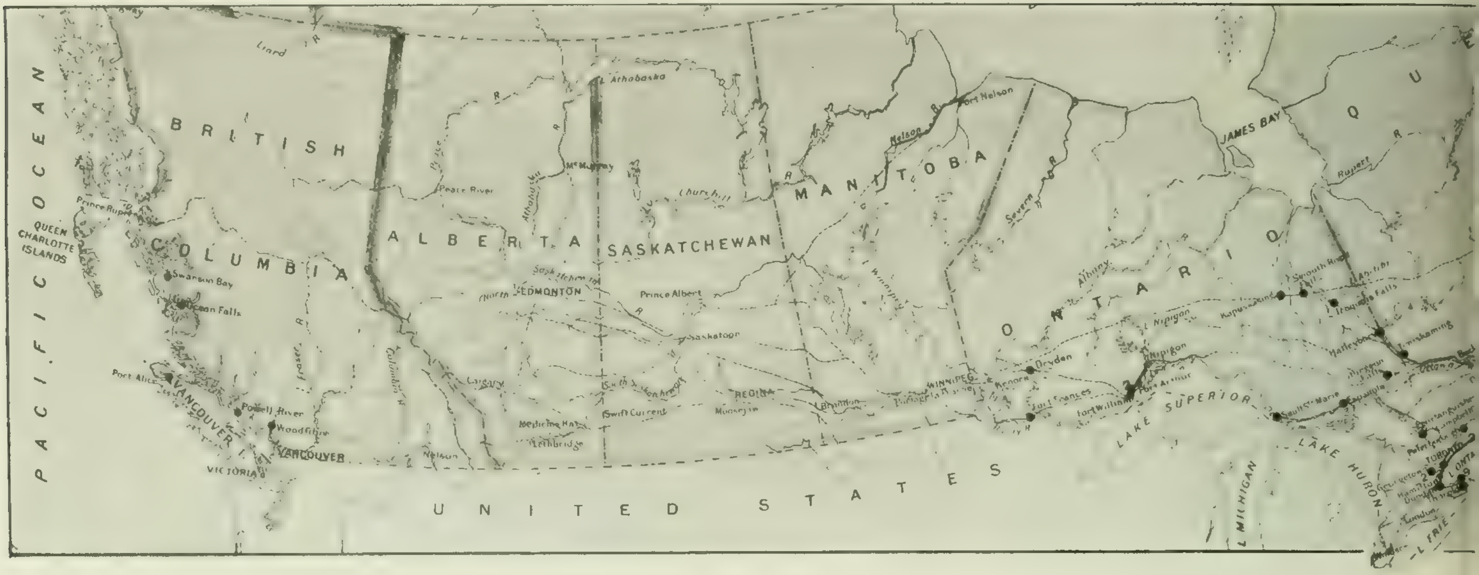
ONTARIO

Ref. No.	Company or Owner	Head Office	Location of Plant	Power Purchased From
8	Fort William Paper Co.,Ltd.	Fort William, Ont.	Fort William, Ont.	Kaministiquia Power Co.
9	Provincial Paper Mills, Ltd.	56 University Ave., Toronto, Ont.	Port Arthur	Hydro-Electric Power Commission
10	Nipigon Fibre & Paper Mills, Limited	Nipigon, Ont.	Nipigon	" " " "
17(a)	Timiskaming Pulp & Paper Co.	Haileybury,Ont.	Haileybury	Northern Ontario Light & Power Co.
18	Fibre Board	Penetanguishene	Penetanguishene	Hydro-Electric Power Commission
27	Interlake Tissue Mills, Ltd.	Merritton	Merritton	" " " "
32	Ontario Paper Co.,Ltd.	Thorold	Thorold	Toronto Power Company and Hydro-Electric Power Commission
33	Hinde & Dauch Paper Co. of Canada, Ltd.	43 Hanna Ave.,Toronto	Toronto	Hydro-Electric Power Commission
34	Don Valley Paper Co., Ltd.	714 Dominion Bank Bldg Toronto	Don Valley,Toronto	Toronto Power Co.
35	Canadian Nashua Paper Co.,Ltd	Peterborough, Ont.	Peterborough	Hydro-Electric Power Commission
38	Canadian Paperboard Co.,Ltd.	2 Seigneur St., Montreal, P.Q.	Campbellford	Town of Campbellford
39	Hydro-Electric Power Com. of Ontario	Toronto, Ont.	"	Hydro-Electric Power Commission
45	Provincial Paper Mills, Ltd.	56 University Ave., Toronto, Ont.	Mille Roches	St. Lawrence Power Co.
47	Cornwall Pulp & Paper Co.,Ltd	Cornwall, Ont.	Cornwall	Hydro-Electric Power Commission and St. Lawrence Power Co.,Ltd.
4[illegible]	Riordon Company, Ltd.	355 Beaver Hall Sq., Montreal, P.Q.	Hawkesbury	Hawkesbury Electric Light & Power Company

QUEBEC

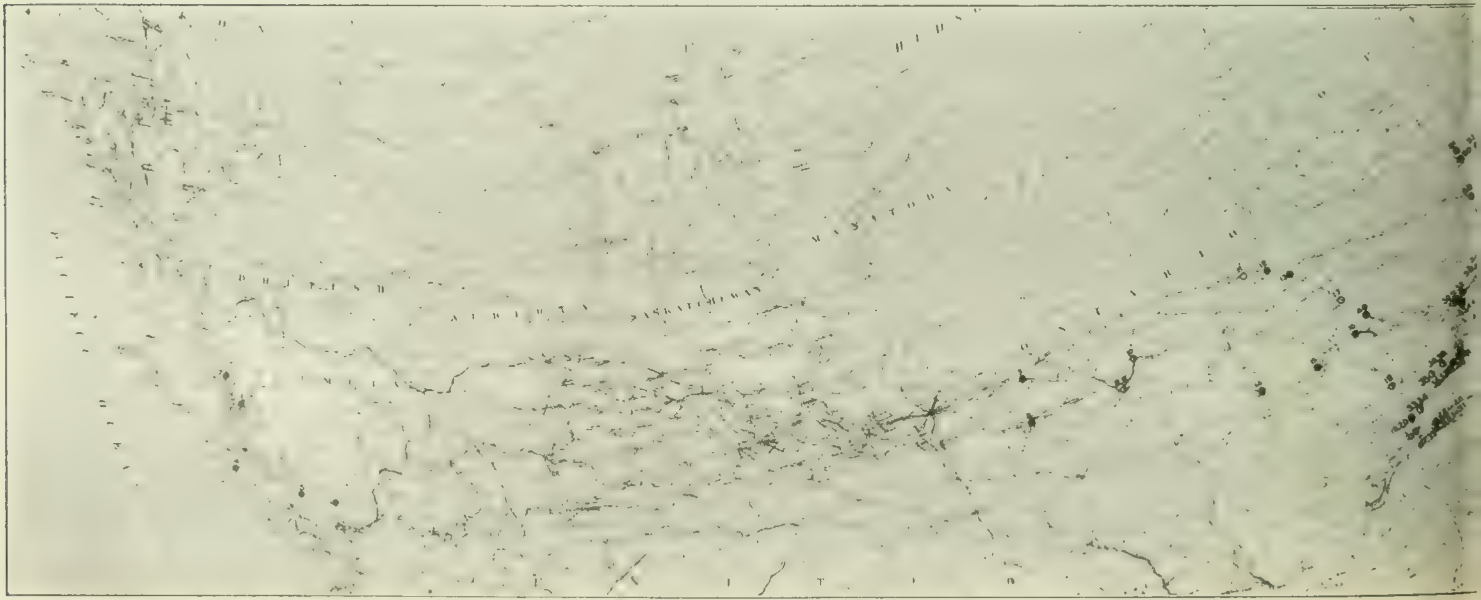
Ref. No.	Company or Owner	Head Office	Location of Plant	Power Purchased From
50	The Beaver Company, Ltd.	Buffalo, N. Y.	Aylmer Road	Hull Electric Co.,Ltd.
57	Valleyfield Coated Paper Mills, Ltd.	Valleyfield	Valleyfield	Valleyfield Electric Co.
61	Bennett Limited	Chambly Canton	Chambly Canton	Montreal Light, Heat & Power Consolidated
64	International Paper Co.	30 Broad St., New York City	Three Rivers	Shawinigan Water & Power Co.
65	Wayagamack Pulp & Paper Co., Limited	Three Rivers	Three Rivers	" " " " "
66	St. Maurice Paper Co.,Ltd.	Board of Trade Bldg., Montreal, P.Q.	Cap Magdelaine	" " " " "
68	Laurentide Company, Ltd.	Grand'mère	Grand'mère	Laurentide Power Co.,Ltd.
96	The Ha!Ha!Bay Sulphite Co., Limited	Port Alfred	Port Alfred	La Soc. d'Eclairage et d'Energie Electrique du Saguenay

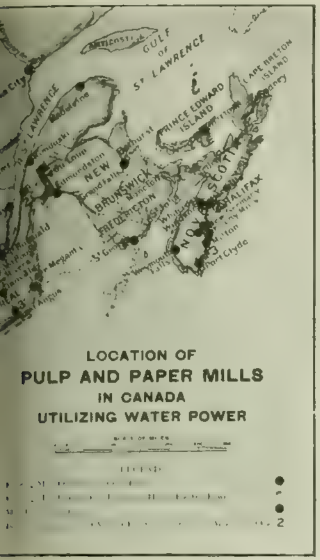
(a) Under construction.



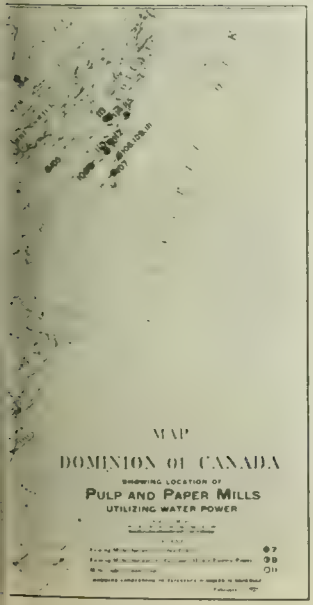
Powell River Mill. — Total installation, 24,000 h.p. under 147 ft. head.

Spanish River Pulp & Paper Mil
operated by local water power
electric plant; total install

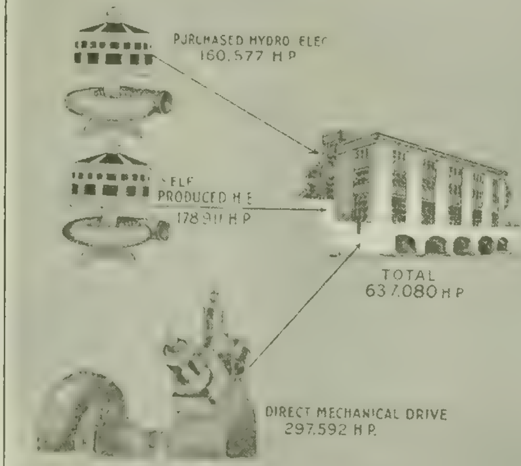




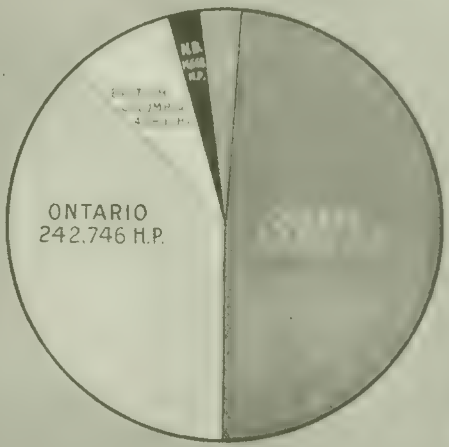
geon Falls —
tional hydro-
90 h.p.



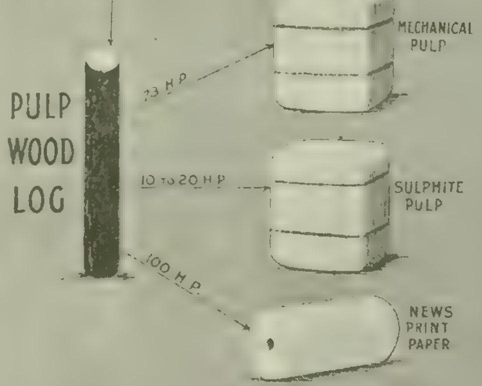
FORM in which WATER POWER is used



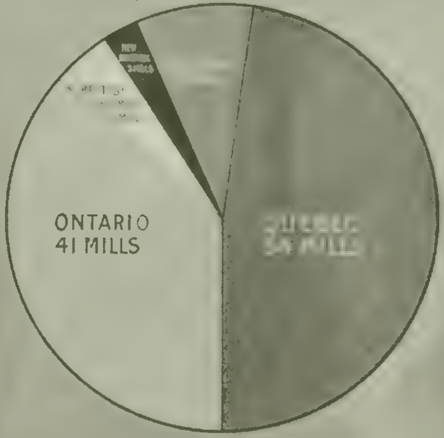
WATER POWER for PULP and PAPER in various provinces.



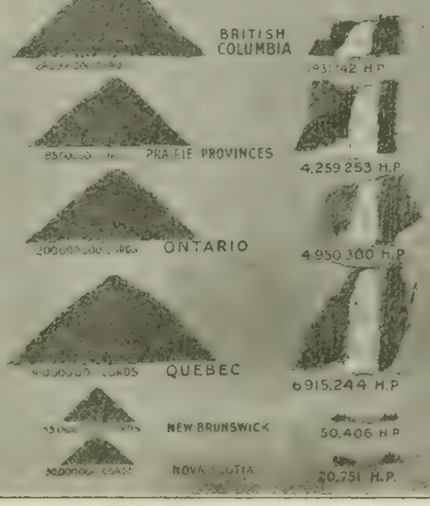
POWER required to produce 1 TON of this from



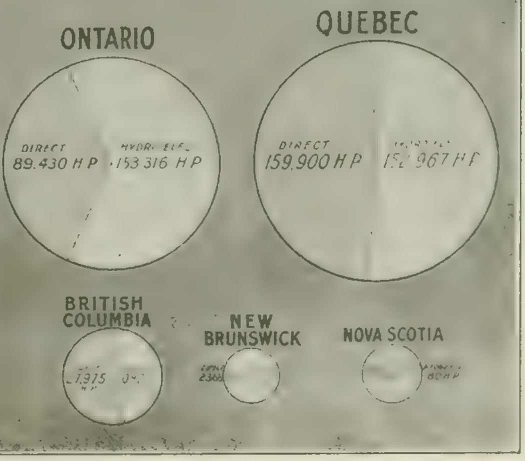
Number of MILLS in each province operated by WATER POWER or purchased by HYDRO-ELEC. energy.



Available PULP WOOD (estimated) & MINIMUM WATER POWER of different Provinces.



Direct WATER POWER & HYDRO-ELECT drive for PULP & PAPER compared in each province.



and paper mills is summarized in TABLE No. 4. While there is still a large amount of water power used to drive the mill equipment directly from turbines, a considerable portion is utilized by first converting it to hydro-electric energy for the more convenient electric motor drive. Column 7 of this table which is made up by adding Columns 4 and 6 gives the total hydro-electric energy, including that purchased from outside sources, and a comparison of these figures with those of Column 3, representing direct drive from water power, shows that the two modes of operation are fairly evenly divided in British Columbia and Quebec; that electric drive predominates in Ontario and New Brunswick, while direct water-power drive is used almost entirely in Nova Scotia.

Abitibi Power & Paper Co. Mill at Iroquois Falls — Supplied from local water power and Twin Falls hydro-electric plant; total installation, 52,000 h.p.

General Conditions in Each Province

A rapid inspection of the data in the various tables shows the province of Quebec slightly ahead of Ontario in the pulp and paper industry. British Columbia ranks next, followed by New Brunswick and Nova Scotia, while this industry has yet to be introduced in our prairie provinces.

Quebec

This province has 54 mills requiring a total of 312,867 h.p. either installed or purchased. The total daily producing capacity of these mills is some 3,000 tons of mechanical pulp, 1,500 tons of chemical pulp, 1,300 tons of newsprint, and 700 tons of other kinds of paper. There are naturally several large mills in this province where much energy is purchased or extensive water-power installations are required; the three largest are at Grand'Mère, where all the hydro-electric energy is purchased; Kenogami, where power is obtained from two hydro-electric plants in addition to that produced at the mill; Shawinigan, where a portion of the power is purchased; each of these mills require some 25,000 h.p. or more. Other large mills requiring between 10,000 and 25,000 h.p. include those at Hull, East Angus, Brompton, Chicoutimi, Clark City and Cap Magdelaine.

TABLE NO. 3.
HYDRAULIC POWER IN PULP AND PAPER MILLS - CHARACTERISTICS OF VARIOUS GROUPS.

Groups	Number of Mills in Group	POWER - H. P.: Own Turbine Installation	POWER - H. P.: Purchased Hydro-Electric	POWER - H. P.: Total for Group	POWER - H. P.: Total per Mill in Group	Avg. Daily Producing Capacity per Mill in Group - Tons: Pulp	Paper: News	Paper: Others
1	2	3	4	5	6	7	8	9
British Columbia	5	48,800	----	48,800	9,760	147	89	6
North & Western Ontario	7	81,150	16,350	97,500	13,930	173	93	4
North Lake Huron	3	48,810	----	48,810	16,270	268	223	---
Niagara & Toronto District	17	6,943	42,142	49,085	2,890	33	18	18
Eastern Ontario	14	33,721	13,630	47,351	3,380	42	12	17
Montreal District & Western Quebec	16	36,558	3,345	39,903	2,660	28	[illegible]	17
Eastern Townships	6	30,152	8,500	38,652	6,440	90	18	24
St.Maurice Valley & Three Rivers Dist.	6	21,110	66,350	87,460	14,570	268	111	17
Quebec City District	14	15,982	3,760	19,742	1,410	15	10	7
Lake St. John & Saguenay District	7	87,900	6,500	94,400	13,490	176	44	[illegible]
Lower St.Lawrence & Gulf	6	32,710	----	32,710	5,450	72	---	---
New Brunswick	3	14,668	----	14,668	4,890	93	---	---
Nova Scotia	10	17,999	----	17,999	1,800	23	---	---

NOTE: The large capacity of mills predominating in certain districts is emphasized by the figures under Column 6, while the class of production characterizing each group can be judged by the figures under Columns 7, 8 and 9.

TABLE NO. 4.
CHARACTER OF HYDRAULIC MOTIVE POWER IN PULP AND PAPER MILLS IN EACH PROVINCE.

Province	No. of Mills	Installed and Purchased Power - H.P.: Turbine Installation in the Industry - Direct Drive	Turbine Installation in the Industry - Hydro-Electric Drive	Total	Purchased Hydro-Electric Power	Total Hydro-Electric Cols. 4+6	Total From all Sources Cols. 5+6
1	2	3	4	5	6	7	8
British Columbia	5	27,975	20,825	48,800	-----	20,825	48,800
Ontario	41	89,430	81,194	170,624	72,122	153,316	242,746
Quebec	54	159,900	64,512	224,412	88,455	152,967	312,867
New Brunswick	3	2,368	12,300	14,668	-----	12,300	14,668
Nova Scotia	10	17,919	80	17,999	-----	80	17,999
CANADA	113	297,592	178,911	476,503	160,577	339,488	637,080

Column 3 represents the installation which is used to drive the mill machinery, such as grinders, etc., directly from water power.

Column 4 represents the installation also operated by pulp and paper organizations but where the power is first converted into hydro-electric energy and electric drive is used to operate all or a portion of the mill.

Column 5 is made up by adding columns 3 and 4 and represents the total water-power installation operated by the pulp and paper organizations themselves.

Column 6 represents the amount of electric energy derived from water power and purchased from central electric stations for use in the pulp and paper industry.

Column 7 is made up by adding columns 4 and 6 and is an indication of the use of electrical energy derived from water power in the pulp and paper industry.

Column 8 gives the totals of columns 5 and 6 and indicates the total installation and purchased power for the industry derived directly or indirectly from water power.

Ontario

Ontario has 41 mills where the installed or purchased power aggregates 242,746 h.p. These mills have a total daily producing capacity of some 2,000 tons of mechanical pulp, 1,100 tons of chemical pulp, 1,800 tons of newsprint, and 600 tons of other kinds of paper. The feature in this province is the Iroquois Falls mill requiring 52,000 h.p. including the energy transmitted from Twin Falls; another large mill is located at Ottawa with an installation of 28,789 h.p. Mills requiring between 10,000 and 20,000 h.p. are numerous and include those at Sault Ste. Marie, Espanola, Sturgeon Falls, Thorold, Fort Frances and Fort William.

British Columbia

British Columbia has 5 mills operated by water-power but they are all of fair size and require a total installation of 48,800 h.p. while their daily producing capacity is 390 tons of mechanical and 345 tons of chemical pulp, 445 tons of newsprint and 330 tons of other kinds of paper. The two large mills at Powell River and Ocean Falls have respective installations of 24,000 h.p. and 20,550 h.p.

New Brunswick

This province has 3 mills only operated by water-power with a total installation of 14,668 h.p. and a daily producing capacity of 30 tons of mechanical and 250 tons of chemical pulp.

Nova Scotia

There are 10 mills operated by water power in this province but most of them are not large; their total installation aggregates 17,999 h.p. and their daily producing capacity is some 230 tons of mechanical pulp.

Future Power Requirements of Industry

A few words may be added regarding the future trend of the pulp and paper industry which should be of particular interest from a water-power point of view. Owing to the present financial depression no very great expansion need be immediately expected. A very realistic illustration of what should be expected when industrial conditions become normal was afforded by the pulp and paper boom of 1918 and 1919. A large number of projected undertakings were then investigated and many requests for information were received by Dominion Government organizations in possession of the desired data, as in most cases the parties concerned did not care in what province the mills were to be established. It was a case of obtaining pulp wood and water power almost at any cost and anywhere within reason. While most of these projects did not materialize owing to subsequent financial and other conditions they revealed what conditions may be expected in the future development of the industry and demonstrated what an important part our northern water powers will be called upon to assume in this connection.

One of the McLeod Pulp and Paper Co. Mills near Milton. — Their two mills have a total water-power installation of 6,024 h.p.

TABLE NO. 5.
AVAILABLE PULP WOOD AND WATER POWER OF CANADA.

Province	Estimated Pulp Wood Resources Million Cords	Available Water Power at Ordinary Minimum Flow h.p.
British Columbia	285	1,931,142
Prairie Provinces	185	4,259,253
Ontario	200	4,950,300
Quebec	300	6,915,244
New Brunswick	33	50,406
Nova Scotia	30	20,751

It has recently been estimated that the present pulp wood demands on our forests consume some 20,000 acres per year and following the trend of other commodities this consumption will most probably assume a rapidly increasing rate. While the reforestation methods now being extensively introduced will later on help to remedy this depletion, it must be noted that a period of from 50 to 100 years is required for suitable growth, and until full results are realized it will doubtless be necessary to extend wood pulp operations farther and farther north and the bountiful supply of water power located in these regions will in no small degree facilitate the fullest development of this industry. Pulp wood and water power are the chief factors in connection with future expansion and TABLE No. 5 shows side by side the proportion of these resources available in each province of the Dominion.

PAPER MAKING IN B. C.

C. J. Kay, president of the Canadian Paper Trade Association, and head of the Columbia Paper Co., Limited, Vancouver, recently delivered an interesting and timely address before the Wholesale Bureau of the Board of Trade in that city on the importance of the industry output of pulp and paper for export in 1890 was $120 and the output in 1921 was valued at put was valued at $174,000,000. Canada's pulp and paper industry had grown to become the second largest in the world.

Mr. Kay said there could be no denying that with the industry still in its infancy on the Coast, British Columbia would be regarded as the great source of supply for the West in the future and the province upon which other rapidly depleting sections would have to rely.

WIDE WALMSLEY MACHINE FOR BELGO

Announcement was made in the Pulp and Paper Magazine last week that the Belgian Industrial Company had ordered a 228" Fourdrinier paper machine from Charles Walmsley Ltd., Bury, Lancashire, Eng., makers of the twin monsters at the Abitibi Power and Paper Company's mill. The machine ordered by the Belgian Industrial Co. will operate at not more than 750 feet per minute, at which speed the production is estimated at an average of 80 tons per 24 hours. It is expected that this machine will be in operation in January 1923. The contract for the drive has not yet been placed but it is quite likely that a sectional electric drive will be used. A machine room will be built to accommodate two of these enormous machines, though only one is to be installed at the present time.

Since The Belgian Industrial Co. has at present a surplus production of sulphite and groundwood, it is not necessary to make any extension to their sulphite and groundwood mills; as a matter of fact, when the new machine is installed there still will be a surplus production of groundwood and sulphite available if the Company operates their pulp mills at maximum capacity. We have heard, however, that it is their intention to reduce the output of groundwood and sulphite to their own requirements after the new paper machine is installed.

Some intimation has been made that should the demand for newsprint warrant the installation of an additional machine The Belgian Industrial Co. would install a second new machine during the year 1923, which would bring their total production of newsprint up to 360 tons per day.

HOW FOREST FIRES START

Do your part in preventing fire becoming master. Look after your camp fire. See it is dead out. Do not throw matches or burning material or ashes where they might ignite leaves or twigs or rubbish and thus set fire to the forest.

British Trade News

(From our London Correspondent)

London, May 1. 1922. I mentioned recently that Sir Vansittart Bowater. the prominent British seller of paper, whose well known firm bears his name in London, was standing as a candidate for the Imperial Parliament in the interests of the City of London. The Conservative Association of the City has failed to adopt him and appealed to him to withdraw. Sir Vansittart said he could not see his way. He is now opposed. It will be a great fight for victory. Sir Vansittart has been treated very unfairly and by not adopting him a breach of custom has occurred. Judging by the present events the election for the two candidates promises to be an extremely expensive one. All the paper men are doing nothing but talking about the election, because "one of their own" is in it.

British Dyes Discovery

Professor Arthur G. Green, the Director of the British Dyestuffs Corporation laboratories, announces the discovery of a new class of dyestuffs, called "ionamics", which will dye a white material in two colors by one operation. The discovery at present is concerned with "acetyl" silk, but it is followed closely by paper manufacturers with a view to future developments.

The production of two colors at once is not entirely new. According to Pliny, the Egyptians obtained two colors out of one dye-bath, but Professor Green's discovery is a milestone in chemical research and may strengthen the hands of others in the laboratories.

Universal Stagnation

The Directors of Messrs. John Dickinson & Co., Ltd., whose mills are in Hertfordshire, in the course of their annual report say that during the greater part of the year there was a universal stagnation in trade and the firm was particularly affected by the unparallelled fall in values, the prolonged coal miners' strike, and the grave difficulties arising from the state of the foreign and Indian exchanges. After passing through such a period of extraordinary and difficult condititons the financial strength of the company is a satisfactory feature.

There is an interesting development about to take place in connection with this firm. The Directors, after recording their appreciation of the services of their employees under conditions of unusual difficulty, announce that they are moving for an alteration in the articles of association, (Firm's constitution), so that an employee of the company may be elected as an annual director. This is an interesting development in these days when one hears so much of Capital versus Labor.

The Wages Conference

The members of the Employers' Federation of Papermakers are now discussing the report submitted by the special committee appointed to discuss with the representatives of the Unions the question of wages and hours in the mills. On May 4 the Unions will announce to the Federation the result of the recent ballot on questions submitted to the workers. Both sides are now getting to closer grips and the industry should shortly know whether it is agreement, or a lock-out. The latter would be a fatal step and is not encouraged by anyone.

An Irish Strike

There is trouble in Dublin. the capital of the Irish Free State. The Irish Paper Mills Co. Ltd., in which Sir Frederick Becker takes a great interest, is enduring a strike at the Cloudalkin mill. There appears to be an eruption over wages. According to the Adjutant of the 3rd Battalion, No. 2 Brigade, 2nd Eastern Division—it sounds war-like—there is a proposed "cut" of 3 cents an hour. And he writes: "I propose that the mills be re-opened immediately, and the matter of the "cut" referred to arbitration, which I shall facilitate in any way I can. In order that your position may not be thereby prejudiced and to help an amicable settlement, I am willing that you should announce that you are acting under orders and shall send you an order to open..." The Manager of the mill promptly replied: "I take leave to inform you that the company does not see its way to obey your orders. I must leave you to adopt what course you think best, but if you have the authority to start the mill yourself no difficulty will be put in your way by me or the company, provided we are properly indemnified for what material, coal, and supplies you use and any damage." The matter, needless to say, is in abeyance. Reading the letter, one would imagine they were in Mexico during the pre-war revolutions.

Poor Chlorine Products Demand

At the annual meeting, held in London, the other day, of the United Alkali Co. Ltd., the chairman (Mr. Muspratt) announced that at Newcastle-on-Tyne the electrolytic plants were working almost full time, but at Widness the similar plants were still on reduced load, as the demand for chlorine products, owing to the depression in the paper trade, was still far below the normal. The position was, however, improving week by week, if only slowly, and every increase in consumption represented a decrease in cost which the company handed on to the consumer in the hope of further stimulating consumption. A small dividend was declared.

China Clay Industry

The China Clay industry has a better outlook. It only remains for a little more briskness to be shown in the paper industry to give china clay a better setting on its feet again. During the past 18 months producers of china clay have gone through difficult times and it is believed now that a new era is dawning on the industry—at least some of the pit men speak hopefully of business in the near future. There are heavy stocks in Cornwall to be cleared out so that a good rush can be easily dealt with, should it ever take place.

Imports of Boards

During March Strawboard was imported into the United Kingdom to the extent of 15,445 tons valued at £119,042. Germany, Netherlands, and Belgium, were the supplying countries.

Millboards were imported to the extent of 1,964¾ tons valued at £41,913. Supplies were received as follows:—From Canada, 346½ tons; Netherlands, 35½; U. S. A., 314¾ tons; Germany, 376½ tons; Finland, 173¾ tons; Sweden, 532 tons; Norway, 186 tons. Canada, it will be noticed, comes next to Sweden and Germany and the Netherlands as a supplying country.

Cardboard and Pasteboard imports were, during March, 383 tons valued at £12,411. U. S. A., Germany, Norway, Sweden, France and Germany are the chief suppliers. Canada does not figure in the import list.

Leatherboards were imported from Germany, U. S. A., Netherlands, Sweden, and Canada, to the extent of 495¼ tons valued at £9.555. Germany shipped 34¾ tons; Nethelands, 11 tons; Sweden, 356 tons; Norway, 27½ tons; Canada, 35 tons, cwt.; U. S. A., 16 tons 13 cwt.; Austria, 10 tons; Finland, 2 tons.

Pulp Market

Chemical: more inquiry; groundwood: demand is fair or more business passing.

The English China Clay Industry

By Our Own Cornish Correspondent

Through the extensive world-wide trade depression the China Clay industry of Devon and Cornwall has been considerably affected and the year 1921 taken as a whole will long be remembered as the darkest period in its history. Cornwall is by-far the largest producing county or clay area in the whole world but some of the clays produced in the adjoining county of Devonshire, particularly from the Leemoor mines of the English China Clays Ltd., are practically unrivalled. The advancement of the English China Clay industry in latter years has been most romantic.

The earliest figures were about one hundred and twelve years ago when the total output recorded was considerably less than 2,000 tons and much of this was sent to the United States.

The premier firm, the English China Clays Ltd., have a normal productive capacity of at least 500,000 tons per annum and the firm of Messrs. A. D. Pochin and Messrs. John Lovering and Co., can easily exceed the 200,000 ton production in a year. Since 1912 the industry has been faced with almost insurmountable difficulties. The strike among the clay workers in 1913 was soon followed by the great European Crisis which nearly submerged the great industry in consequence of so many volunteers that enlisted and the staffing of the mines became a difficult problem. One restrictive measure after another so threatened the industry during the war that an association evolved and under the auspices of the Associated China Clays Limited the industry became organized and about 90 per cent of the entire output of Cornwall and Devon was subsequently controlled by this association, whose offices are in the China Clay Town of St. Austell. The association has been instrumental in securing that indiscriminate competition amongst the producers and has secured many other commercial advantages which have assisted very materially in the reduction of prices of this important raw material. China Clay as a raw material which enters in so many important manufactures that the slightest recovery of the general trade of the country will soon be be reflected in an increased demand for China Clay. For many years Germany and other continental markets were large importers of our China Clay, but the war and the adverse exchanges have compelled the continental users of our clay to extend their own domestic clay production to the detriment of the Cornish industry.

When the momentous questions were settled at the Washington and Genoa conferences we hoped consideration would be given to the World's Financial Burdens and something done to stabilize the rates of exchange so as to assist international trade and prosperity generally. In view of the recent business tour in the United States of Mr. J. W. Higman of St. Austell, he very kindly gave me some of his impressions obtained in relation to the trade conditions prevailing in that great country. It was Mr. Higman's twenty-first visit to the States and on this occasion he visited many towns in the central West including Kalamazoo. Business was found to be certainly improving and mills which were closed have been re-started whilst mills working on half-time had increased to 75 % or even more. The domestic clays of America have been used by some paper mills for a considerable time because they have been cheaper and obtained more conveniently from the clay areas of South Carolina, Georgia and Virginia where the railway rates operate favorably, but in those manufacturing centres that are situated near New York, Boston and Portland the domestic producers cannot compete with the English Clays in price and of course they do not pretend to compete in quality.

The English Clays are recognized throughout the States and Canada as by far the most superior and the Cornish and Devon producer could rest assured that the great paper manufacturers of the United States and also of Canada would be obliged to have their supplies of Clay from England for many years to come.

The American and Canadian Paper industry is the best customer of the English China Clay, and fully 75 per cent of the exports to those countries is used for paper making. The producers of the domestic clays in America were rather keen on the subject of increasing the tariff on china clay sent out from England and buyers as well as consumers of English clays who are not an insignificant body in the States are naturally in opposition to the proposal.

In the extension of English China Clays, Ltd., his firm, and the clay industry generally Mr. W. Sessions has taken an outstanding interest. He has made several visits to the States on behalf of the firm he represents and for the benefit of the industry and very few have been enabled to investigate the conditions which had created such a world-wide depression. He rightly contends that the abnormal price of coal and other mining materials as well as the excessively high wages and also that insidious disposition to retard production have been and are still a serious deterrent to business. English Clays are now comparatively high priced raw material in place of what was regarded with its accompanying low freights before the war as a manufacturing commodity of unparalleled cheapness throughout the whole world, and in consequence secured an unprecedent demand. Mr. Sessions, however, does not hesitate to predict that trade even equal to the pre-war tonnage can again be secured under a united control accompanied by a reasonable reduction in working expenses and materials and a return to a more reasonable rate of wages. The Town of St. Austell has become an important centre for the English China Clay industry and here, all the producers of any repute have their chief offices. The associated China Clays Ltd., a combination of Clay producers which controls over 90 per cent of the entire production hold their monthly meetings at St. Austell under the chairmanship of the Hon. H. D. Mc Laren, M. P., the son of Lord Aberconway, in "Ye old House" a famous and very substantial mansion in the very heart of the Town.

China Clay is one of the few raw materials that has not been seriously drained by the war. Its inexhaustible and easily procurable supplies are therefore likely to be intensively exploited when the cycle of the worlds trade operates more favorably. The spirit of progression has apparently laid hold of the industry and with the aid of research observation and experience with a return to costs approximating these pre-war days there is no reason why the English China Clay industry should not revert to that period of activity that so significantly characterized it before the European Crisis.

If one simply reflects upon the numerous articles of manufacture that China Clay has been applied in a greater or less degree, it is almost unbelievable. Its use in paper, pottery and textile manufacture is well known and needs no comment but the lesser uses that china clay enters into are in the production of ammonia, sulphate, sulphuric acid, aluminium, alum, colored pigments, washing and cleansing soaps, water softeners, sewerage purifiers, metal and plate cleansers, stove and boot polishers, toilet powders, cosmetics, toothpowders and paste, ultramarine, starch, chemical manures and fertilisers, disinfectant powders and paint, crayons, pencils, linoleum, clay-beds for hand-writing and type-writing duplicators, picture-frame moulding, asbestos, fire brick, boiler-packing, plaster modelling materials, buttons, knife and fork handles, tanning, brewing and rubber. And even these do not complete the variety of purposes because china clay is employed in other things known only to the users themselves and thus it can be regarded as one of the most useful and multipotent of all the raw materials produced. Only the purest and whitest of our clays are used in the finest grade papers and for such the English Clays are not only preferable but practically indispensable.

OLD COUNTRY NOTES

The following notes were sent to the Pulp and Paper Magazine by H. M. British Trade Commissioner.

There is a general feeling in the paper and stationery trades that the outlook for business is improving slightly. The volume of trade passing was distinctly larger than that secured during the preceding month.

It is believed that in the near future the price of paper will stiffen.

An interesting and important announcement has been made by Harrison and Sons, Ltd., Printers-in-Ordinary to His Majesty, of 44-47 St. Martin's Lane, W.C., and Perkins, Bacon And Co., Ltd., of Southwark Bridge Buildings, S.E.1 stating that they have made arrangements whereby, while their business will be carried on under the same management as before, their resources will be combined so that all classes of steel plate and other engraving, printing from plate, offset lithography or letterpress, binding, stationery, etc., will be executed by the associated firms in whichever department is most suitable and economical.

Perkins, Bacon and Co. are the well-known engravers who, in 1840, produced Rowland Hill's original penny postage stamp, and for forty years supplied the British public with "Queen's Heads," while Harrison and Sons, who have been confidential printers to the Government for close upon two hundred years, have since 1911 produced the British stamps by the surface printing process at their modern works at Hayes (Middlesex).

The association of these two firms of British stamp printers (both established over one hundred years ago) is in a way unique, and should present a very strong combination of skill and efficiency in the classes of work in which the associated firms respectively specialise.

Another important amalgamation has been completed in the Printing trade. Bemrose and Sons, Ltd., Derby; Alfred Cooke, Ltd., Leeds; and Norbury, Natzio and Co., Ltd., Manchester; have combined under a holding company entitled the Universal Printers, Ltd., London, with a nominal capital of £800,000.

These companies embrace practically every process of printing and should be in a position to enter into competition with foreign producers.

An important development has recently been made in reproducing photographs in newspapers. A newspaper has been printed for the first time by the photo-litho process on a rotary offset machine. By this means photographs can be printed on ordinary newsprint paper, bringing out all the details as if they had been printed on art paper. The quality of the illustrations is eminently successful, and one cannot imagine that even the machine gravure process could have achieved so much under newspaper conditions, especially considerating the quality of paper which is used.

A WONDERFUL OPPORTUNITY

The annual summer meeting of the Technical Section of the Canadian Pulp and Paper Association, on June 20 and 21, promises to be of exceptional interest. The executive council has accepted an invitation from the Abitibi Power and Paper Company, Limited, to visit the company's mill at Iroquois Falls, Ont. The committee of arrangements—Messrs. R.W. Hovey, C. Nelson Gain, A. L. Dawe, J. N. Stephenson and Edward Beck—are anxious that the meeting should be very well attended, believing that the visit will prove of great educational value, having regard to the extent and completeness of the mill. Last year its productive capacity was increased from 250 to 510 tons of newsprint a day by the installation of three new machines, making it the largest newsprint plant under one roof. One of the machines is 158 inches in width, and is equipped with the Westinghouse synchronous electric drive, each unit having its own motor. The Pusey-Jones Company of Wilmington, Del., supplied this machine, while two others, each of which is 232 inches wide, were built by Charles Walmsley and Co. of Bury, England. They are the largest newsprint machines in the world, each having a capacity of 98½ tons daily, at a speed of 700 feet per minute. The grinding machinery was increased by the addition of twenty-one grinders and a new wrapping machine installed, with an output of thirty tons a day.

The completed plant possesses many unique and individual features well worth the inspection and study of those interested in paper mill mechanics and efficiencies.

The Company's power development is also one offering opportunity for inspection and comparison.

The local arrangements are in the hands of Mr. R. A. Mc Innis, general manager of the company and Mr. R. W. Hovey.

The members will leave Toronto or Montreal, or whatever point is most convenient for them, on Monday, June 19th, uniting at North Bay, Ont., on Tuesday morning. Negotiations are under way for the engagement of a special train from North Bay to Iroquois Falls and return with dining and sleeping car accommodation.

Wednesday, June 21st, and Thursday morning, June 22nd, will be devoted to an inspection of the Abitibi plant. Returning, the party will leave Iroquois Falls on Thursday, June 22, at 1.15 p.m., arriving at North Bay at 10.30 p.m. and at Montreal and Toronto, respectively, the following morning.

First-class return railway fare will be as follows:—

From Montreal to Iroquois Falls and return ..	$35.95;
From Toronto to Iroquois Falls and return ..	$28.90.

It is certain that those who attend will have not only the opportunity of inspecting one of the finest mills on the Continent, but will enjoy the visit from the social standpoint.

Offices in Toronto of pulp and paper mills in the Niagara peninsula are interested in the possibility of making practical use of radio telephony to keep in touch with their mills. The distance is less than fifty miles, and operators in St. Catharines and vicinity are regularly listening in to the broadcasting from Toronto. The commercial set with its own special wave length seems only a short step further.

Russell A. Pettengill announces that The Russell A. Pettengill Co. shall be known hereafter as Pettengill Incorporated, Industrial Engineers, 1700 Prarie Ave., Chicago, and the expansion of his business through the establishment of Pettengill & Associates, Industrial Engineers, 27 School Street, Boston.

PULP AND PAPER NEWS

We are informed that ground is being broken in preparation for the construction of the mill of the Three Rivers Pulp and Paper Company, Limited.

The pulp and paper industry is well represented on the committees of the Montreal branch and the Quebec Division of the Canadian Manufacturers' Association. The following are members of the executive council of the Montreal branch: Messrs. A. D. Huff, Riordon Company; Art. Harvies, Canadian Paper Box Company; T. P. Howard, Howard Smith Paper Mills, Limited. On the committee of the Quebec Division: Messrs. A. S. Ginger, Howard Smith Paper Mills, Limited, Montreal; H. Biermans, Belgian Industrial Company, Limited, Shawinigan Falls; J. Rolland, Rolland Paper Company, St. Jerome; H. C. Price, Price Brothers and Company, Limited, Quebec City. The elections were held at the annual meeting held in Montreal last week.

The Montreal Paper club has decided to make a vigorous effort to increase the membership, believing that the club can be of great value to the pulp and paper trades and allied interests. With this object in view the executive have appointed the following as a membership committee.—Messrs. H. Larkin, Federal Paper Company; C. Jodin, Rolland Paper Company; M. A. Reid, Barker, Ellis and Company; A. Villeneuve, Rolland Paper Company; and J. M. Hampshire, E. B. Eddy Company.

It is of interest to note that Sir T. Vansittart Bowater, who is contesting the City of London Parliamentary seat vacated by the Earl of Balfour, is a paper maker in a large way of business. He is a former Lord Mayor of London, and is nominated as an Independent Conservative candidate in opposition to Mr. E. C. Grenfell, the official candidate.

The sudden death of Mr. Thomas F. Judge, general manager of Lord Northcliffe's paper mills at Grand Falls, Newfoundland, is announced. He was a native of Biddeford, Maine, a graduate of the University of Maine, and a member of the Technical Section.

Mr. W. Gorman, of the Montreal office of the Provincial Paper Mills, Limited, is, we regret to learn absent from business owing to illness.

PAPER CLUB ENJOYED FILM

There is every promise that the efforts now being made to augment the membership of the Montreal Paper Club will meet with success. As our readers are aware, the by-laws have been amended in order to admit of printers' salemen and large buyers of paper. The result was evident in the large attendance at the Luncheon at the Queen's Hotel on May 6. The chief item on the program was the film loaned by Price Brothers and Company, Limited, illustrating that company's operations, from felling the tree to the shipping of the newsprint. The film showed the extensive activities of the company, particularly the large timber limits, the camp and driving operations, and the methods employed to break up jams on the drives. It was a very appropriate film for such a gathering, and apart from the purely pictorial interest, possessed an educative value for those directly and indirectly associated with the paper industry.

Prior to the showing of the film, Mr. R. MacLean, the president, explained the reason for enlarging the scope of the club, adding "This is clean-up week and we expect to clean up all those here in the way of membership."

Mr. A. L. Dawe added a few words as to the objects of the club, emphasising its value to those who are interested in the paper business.

NO INCREASE IN NEWSPRINT PRICE PROBABLE

"While the newsprint industry may be said to be in a better position than it was a year ago, or even six months ago, it is certain that there is no real ground for the over optimistic statements and rose-colored forecasts that are being spread abroad, presumably for their effect upon stock market speculations," said Mr. George M. McKee, president of the Canadian Pulp and Paper Association, when asked this week by the Editor as to the truth of the reports that the paper industry is rapidly approaching the high level of prosperity it enjoyed in 1920.

"It is quite true," said Mr. McKee, "that most of the Canadian mills are at present producing a greater volume of paper than they did during the slump period of last year. We hope that this is more than a passing condition brought about by seasonal influences and the desire of the newspaper publishers to forestall delayed shipments owing to the coal strike and to threatened labor troubles within the industry itself, but this cannot be determined accurately until the Summer has further advanced and the publishers are able to estimate their fall requirements. At present newspaper circulation and advertising volume both show a gratifying increase over last year which, if it continues, will undoubtedly help the situation.

"The persistent rumors of an increase in the contract price for newsprint before the end of the year can, however, have no substantial basis inasmuch as a sufficiently large proportion of the Canadian manufacturers are already committed for the remainder of the year to ensure price stability.

"While it is generally admitted, even by informed publishers, that the current price of newsprint does not yield an adequate return when current production costs are taken into account, the prospects for improvement in that direction are not encouraging but must await the developments of the future."

FORESTS FIRES AND THE CITIZEN

Forest fires have made such inroads upon Canada's forests, that no citizen having the country's interests at heart can refrain from adopting every sensible precaution in his personal conduct. Unextinguished camp fires, lighted matches, and tobacco have robbed the nation of millions of dollars in public-owned property. To leave a camp-fire burning while in or near standing timber is a plain invitation to a disaster. The lighted match and the cigarette are in the same category.

An excellent way to determine the value of an employee is to give him a lot of spare time and then to observe what he does with it.

Technical Section

REVIEW OF RECENT LITERATURE

A—Properties, chemistry and testing of materials and products

A-4 Comparative Methods of Determining the Lignin Content of Chemical Pulp. E. HEUSER & G. WENZEL. **Papierfabr.**, xix, 1177-1184, (Oct. 21, 1921). The various mehtods are discussed and compared with each other. The method of Konig and Rump or of Becker gives too high values because of the separation of colloidal material with the lignin. The method of Willstatter and Zechmeister may be applied to this determination provided the pulp is hydrolized with 7 parts of hydrochloric acid for a sufficient time, diluted with 10 parts of water and heated to boiling for about 10 minutes. The method of Krull (treatment with hydrochloric acid gas) gave values much too high, though the method might be modified by sufficient study. The method of Konig and Rump (1 percent hydrochloric acid) likewise gave too high results. Comparison is made of these results with indirect methods such as the methyl and methoxy numbers and the phloroglucinol method of Cross and Bevan. It would seem that at present the modified Willstatter and Zechmeister method gives the most reliable results. -I. G.

A-11 Examination of China Clay. JAMES STRACHAN. **Paper**, xxix, No. 21, 16-18, (Jan. 25, 1922; **Paper Trade J.**, 1xxiv, No. 1, 46-47, (Jan. 5, 1922). The author considers that a 12 per cent moisture content for clay with present methods of drying is fairly reasonable; but as moisture is absolutely useless to the paper maker and represents so much dead weight that he has to handle and cannot put into his paper, the producer should adopt modern methods of drying by which the moisture content could be reduced to 1 or 2 per cent without danger of calcining. The following are suggested as practical standards for the maximum amount of grit allowable in various grades of clay; China clay for coating not more than 0.1 per cent for fine papers not more than 0.25; for news not more than 0.5; low grade clays containing 5 to 10 per cent mica should be described commercially as "mica clays". A method is described for the determination of grit by repeated sedimentation and decantation in beakers or jars of standard size. -A. P. -C.

A-12 A-15 Alleged Absorption of Alumina from Aluminum Sulphate Solutions by Cellulose. ALFRED TINGLE, E. B. Eddy Co., Hull, Que., Canada. **J. Ind. Eng. Chem.**, xiv, 198-199, (March 1, 1922); **Paper**, xxix, No. 26, 9-10, (March 1, 1922). The observed withdrawal of alumina from solutions of aluminum sulphate in the presence of cellulose is due to chemical precipitation by non-cellulose material present as an impurity. Both neutral and basic solutions of aluminum sulphate were brought in contact under various conditions with cellulose in the form of (a) acid-washed filter paper, (b) bleached sulphite spruce pulp. By the methods employed, no change in the aluminum content of the solutions could be detected, except when a pulp was used which contained calcium compounds and gave a strongly alkaline reaction to water, with which it was extracted. The deduction is made that absorption does not occur to any appreciable extent, and that the phenomena which have been accounted for by this cause are due to other causes. The question should be thoroughly investigated and an authoritative decision reached when pure standard cellulose becomes available for research. Methods of investigation which attempt to separate aluminum salts from cellulose by repeated washing can only be employed when great caution is used as to the nature of the materials, and can never be trusted when basic solutions are in question. The experiments carried out are described in detail. -A. P. -C.

A-0 Beet Pulp as a Substitute for Wood Pulp in the Manufacture of Paper. Fr. patent No. 517, 302, F. S. GERONA, **Chimie et Industrie,** vii, 127, (Jan. 1922). Beet pulp contains about 80 per cent of utilizable material free from incrusting matter. It can be mixed with other fibrous materials in proportions up to 50-70 per cent. It can be used dry for the manufacture of ordinary grades of paper, and fresh, either as it comes from the diffusers or after fermentation, for the manufacture of the finer and whiter grades. -A. P. -C.

B—Forest ry and Woods management

B-2 Fertilizer Experiment with Spruce Transplants. SIEFERT and HELBIG. **Forstwiss. Centralbl.,** xlii, 258-261, (1920); **Botan Abs.,** ix, 32, (Aug. 1921). Results of observations (1914-1917) on the height growth of spruce transplants, some unfertilized and other treated in 1909 with various fertilizers, are presented. The plants to which nitrate fertilizers had been applied showed more rapid growth during the first few years, but by 1917 had been overtaken by the unfertilized ones, whose actual percentage growth at that time was considerably greater. (Compare next abstract.) -A. P. -C.

B-2 Results of Nitrogen Fertilizer Experiments with Spruce. M. HELBIG. **Forstwiss. Centralbl.,** xlii, 262-267, (1920); **Botan. Abs.,** ix, 23, (Aug. 1921). The results of experiments in fertilizing spruce nursery stock, 1907-1917, are summarized. The conclusion is reached that fertilization of young spruce with nitrates alone is not profitable, but that complete fertilization is advantageous in cases where tall planting stock is desired at an early age. -A. P. -C.

B-2 Observations on the Planting of the Quicker Growing Conifers. H. S. STEWART. **Trans. Roy. Scottish Arboric. Soc.,** xxxiv, 141-145, (1920); **Botan. Abs.,** viii, 266, (July 1921). Spacing even as close as 3 feet in the case of Douglas fir and Japanese larch does not prevent, and only partially restrains, branch growth. If clean boles are required, hand pruning close to the stem must be resorted to. Such spacing, moreover, results in the production of many suppressed boles of little value which interfere with the root development of the more vigorous, dominant neighbors. Spacings of 5.5, 6, and 7 feet are advocated respectively for Sitka spruce, Japanese larch, and Douglas fir. -A. P. -C.

B-2 What it Costs to Plant Artificial Forests. Pulp and Paper, xix, 956, (Sept. 15, 1921). A few of the figures obtained by the Woodlands Section of the American Pulp and Paper Association in its investigation into the cost of commercial planting of forests are given, indicating that costs are much lower than have customarily been estimated. The figures given show a cost of $5 to $15 an acre in several States of the Union, while one big Canadian Company planting much closer than is the custom in the United States found its cost to be $15.12 an acre. -A. P. -C.

B-4 Pure Cellulose from Waste Wood. Ger. Patent No. 341, 673, DRIM, FUTTER-MITTEL-UND ZELLSTOFF G. m. b. H., Aug. 7, 1918. The woody mass, which is previously subjected to a steaming and extraction process, is ground up into a fine wet mass, which is subjected to the action of chlorine gas. The process is a continuous one, a steady stream of chlorine gas passing in countercurrent to the stream of wet, finely-divided wood. -I. G.

D—Mechanical pulp manufacture

D-1 Freeness Tester. Ger. Patent No. 342,574, F. R. ROLLER and K. FERDA, Jan. 30, 1921. A machine for testing groundwood to determine whether it is wet or free. -I. Q.

D-4 Wood Pulp Grinders. HOYER. **Wochbl. Papierfabr.,** lii, 4334-4346, (Dec. 31, 1921). Details are given regarding the feeding of the presses, the charges that they can handle, the choice and the sharpening of the stones, as well as the regulation of the wood pulp grinders. -I. G.

E—Acid processes of pulp manufacture

K-12 Paper Drying Apparatus. Ger. Patent No. 343, 027, H. L. KUTTER, May 8, 1915. A paper drying device in which the directly heated drying cylinders are arranged in vertical series in such a manner that the cylinders of one series are placed in the center in between two drying cylinders of the other series, and the continuous band of paper is passed in snake-like fashion over the cylinders. -I. G.

K-18 The Manufacture of Hard Pasteboard. H. POSTL. **Wochbl. Papierfabr.,** lii, 4154, (Dec. 17, 1921). A discussion of a number of conditions that must be observed in the course of such manufacture. -I. G.

E-1 Determination of Sulphur Dioxide and Lime in Sulphite Liquor. B. DEUTSCH. **Wochbl. Papirefabr.,** liii, 314, (Jan. 28, 1922). A comparison of Winkler's, Hohn's and Sander's methods, in which the lime content is calculated from the total and free sulphur dioxide contents. The author suggests determining lime as oxalate, titrating total sulphur dioxide by means of standard iodine and starch indicator, and calculating the free sulphurous acid. This method would have the objection that the lime is not all combined with sulphurous acid, part being combined with sulphuric acid; so that the combined sulphurous acid would be too high and the free too low. A correction could, however, be made by determining sulphuric acid. The potassium permanganate method was also tested out but was found to give uncertain results, probably due to the formation of dithionates. -I. G.

E-2 Utilizing Vapors from Sulphite Blow Pits and from Sulphite Waste Liquors. Ger. Patent No. 344, 955, E. MUERBE, Dec. 2, 1921. The vapors are passed through a gas separator to separate the sulphur dixoxide from the condensed steam, and after cooling to about 25 degrees C. the sulphur dioxide is redissolved in the condensate, any undissolved gas being fed to the sulphite towers. The sulphurous acid combined with the lignin in the spent liquor, which amounts to from 20 to 25 percent of the fresh liquor used, can be recovered by the use of the heat in the vapors. The combined acid is evolved in the course of the treatment of the liquor in autoclaves on applying heat, and the lignin is separated out of the liquor at a high pressure (about 20 atmospheres) and at a high temperature (200 to 210 degrees C.) -I. G.

E-2 Decomposition of Sulphite Waste Liquor. Ger. Patent No. 341, 857, A. S. SULFITKUL, Oct. 26, 1919. The waste liquor is decomposed at high pressure and temperature with splitting off of the chemically combined sulphur dioxide. It is first sent through a preheater in a continuous stream and thence through a decomposing vessel. The liberated sulphur dioxide is drawn off at the top, while the decomposed liquor and the lignin which is precipitated therein is drawn off continuously at the bottom. -I. G.

E-2 Protection of Containers Against Acids in Sulphite Waste Liquors. Ger. Patent No. 341, 765, HUGO LAUBER, March 2, 1919. Concrete tanks, used to store sulphite waste liquors, are protected against the action of the acid in these liquors by coating the walls with a layer of gypsum. -I. G.

E-5 F-5 Efficient Utilization of Heat in Stationary Boilers. B. HAAS. **Chem. Ztg.,** xlv, 1035-1037, (1921). The experiments conducted by the writer reveal the fact that the digesters used in paper mills which possess dimensions in the ratio of 5:6.4 or 3.6: 5.55 require considerably less heat than those with dimensions in the ratio of 4:10 or 3:8. An explanation of this fact is given. Automatic digesters with dimensions in the latter ratio will give more economical results when the heating coils are removed from the walls as far as is practically possible. -I. G.

E-0 Cement Lined Pulp Digester. Ger. Patent No. 349, 396, E. BELANI. The interior iron wall of the digester is well cleaned and then coated with Portland cement wash. After this has dried, a coating of cement made in accordance with special mixing proportions and of a definite thickness, is applied. Small spiral wires are used for reinforcing the cement. They are arranged in a definite geometric pattern and serve to increase the tensile strength of the lining. The use of these spirals makes the coefficient of expansion of the lining practically equal to that of the iron shell, so that the formation of fissures in the lining is prevented and the acid liquor cannot penetrate through the cement and attack the shell. -I. G.

E-0 F-0 The Heat Problem in the Pulp Industry. G. SUNDBLAD. **Zellstoff u. Papier,** i, 208-209, (1921). The Stalnacke digesting process makes possible the working with about 20 per cent. less liquor. The liquor is made stronger and less of it is used. After the digestion is complete the liquor is drawn off while still hot. In this way about 38 kilos of coal are saved per ton of pulp produced. The channeling of the presses, as recommended by Schaaning, makes it possible to press out about 50 per cent. of the water, thus saving about 1150 kilos of steam per ton of pulp. In the Ullgren process a part of the heat in the air and steam leaving the drying chamber is utilized for pre-heating new air. The steam accumulator, devised by Ruths, results in savings in coal amounting up to 20 per cent. Several processes for the recovery of combustible material from the waste liquors are described. -I. G.

G—Apparatus and processes for treating pulp

G-6 Purification of Pulp. Ger. Patent No. 343, 025, EXPORTINGENIEURE F. PAPIER U. ZELLSTOFF-TECHNIK G. m. b. H., May 8, 1920. An apparatus for removing knots and heavy constituents from slush pulp. A semi-circular canal, which increases in width constantly, is formed in the directions of flow of the pulp which is led therethrough. The semi-circular canal is open upwards, so that the direction, as well as the speed, of the stream of stock is changed. -I. G.

G-6 K-11 The Partington Rotary Screen. Papeterie, xliv, 64-66, (Jan. 25, 1922). Brief description of the merits of the Partington rotary screen, Which are: noiseless operation; no joints, packings or rubber aprons; elimination of vibrating plates and hence decrease in power consumption; simple, automatic, and visible rejection of tailings; the drum can be taken apart; when the quality of the stock is changed, the plates are easily changed to meet the new requirements; ready adjustment of the length of the stroke and the number of revolutions per minute. -A. P. -C.

(Continued on page 419)

UNITED STATES NOTES

In the death on May 9, of James A. Outterson, of Carthage, the paper making industry of Northern New York loses a conspicuous leader as well as one of the few remaining pioneers. Mr. Outterson's death was quite unexpected as his illness had been regarded as only a slight one. He succumbed, however, when it developed into pneumonia. Until his death, Mr. Outterson was president of the De Grasse Company, the Carthage Sulphite Pulp and Paper Company, the High Falls Pulp and Paper Company, the Ogdensburg Paper Mills, the Quebec and Saguenay Pulp Company and the Carthage Machine Company. He was negotiating the purchase of the Champion Paper Company plant with a view to consolidating it with his other mills at Carthage and Ogdensburg. Mr. Outterson is survived by his widow, one daughter and two sisters.

Jacob Kindleberger, president of the Kalamazoo Vegetable Parchment Company, is of the opinion that industry is paying too much attention to machinery and tending to forget the human element. Addressing the Kalamazoo Valley local division of the Cost Association of the Paper Industry recently, Mr. Kindleberger called attention to the danger of being over systematized. "A cost system is a good thing if coupled with good sense," he said. "Get your facts straight. Your attitude must be correct to get co-operation. The cost man should be a student of human nature. Insist on getting accurate reports. One thing at a time is enough. Don't be afraid to get out in the mill and get your hands dirty, and don't be so over-systematized that you forget the human element. That is the biggest factor in business." He suggested also that more benefit might be derived from representative gatherings if the usual speech making gave way to round table discussions.

The International Paper Company has secured the services of Herbert Lippit, who was formerly associated with the Brown Company, Portland ,Me., to take charge of the manufacture of International cores, a new product. These cores are to feature a metal edge invented by Mr. Dodge, president of the company.

Noah Bryant, for many years a leader in the paper industry of the Kalamazoo Valley district, died at Kalamazoo May 4th. He was eighty-three years of age.

ANNUAL WAGE AGREEMENT ARRANGED

(By Canadian Press.)

New York, May 12.—Fourteen of the larger manufacturers of newsprint paper in the United States and Canada had arrived at settlements with workers in the paper trades tonight in the close of a series of wage conferences with unionized employees.

Contracts generally have been signed with skilled workers without reductions of the scale and in some instances with slight increases. Most of the contracts fail to provide a universal scale for unskilled workers, leaving this to be fixed by localities.

Floyd Carlisle, spokesman for the "arbitration" group of manufacturers, asserted that practically all of the 30 newsprint paper companies in America will adjust their wage scales to conform to minimums and maximums agreed upon by the concerns negotiating here.

J. P. Burke, president of the International Brotherhood of Pulp and Sulphide Workers, the largest division of unskilled men in the industry, prepared to leave New York tonight at the close of an unsuccessful fight for an international scale for his men. He refused to sign any of the contracts providing payment of common labor by localities. He signed with several independent companies, however, which expressed a willingness to negotiate with both skilled and unskilled crafts.

Companies signing contracts which failed to provide a universal scale for the unskilled men include the Abitibi Paper Company, the Minnesota and Ontario Paper Company, the Fort Francis Paper Company. The St. Croix Paper Company was expected to sign a similar contract at Boston today.

An agreement specifying wages for both skilled and unskilled men was signed late today by the Degrasse Paper Company announced it would enter a contract with skilled men tomorrow.

Wage scales vary in each agreement, but in the main coincide with that adopted for the arbitration group.

They vary from a minimum of 37 cents an hour for unskilled to a maximum of $1.00 for skilled, in some of the mills, to a minimum of 34 cents and a maximum of 90 cents, depending largely upon types of machinery in operation and grades and sizes of the product.

The unskilled workers were not included in the agreement, the manufacturers holding out for a locality wage with respect to them. While it is thought that a strike in the industry has been averted by this agreement, the representatives of the unskilled workers discussed the effect their walking out might have upon the mills. Some of the delegates said that they did not see how the skilled men could remain at work if the unskilled struck. For instance, if five men are at work on a machine, two of them may be skilled and the others unskilled. John P. Burke, head of the union which embraces the bulk of the unskilled workers said: "I think the skilled men have committed a grave mistake by signing the agreement and leaving the unskilled men unprotected. That sort of thing makes for the destruction of union solidarity." The mills which are party to the agreement include most of the newsprint manufacturers in the United States and Canada except the International Paper Company. Three large companies, two of which are members of the Manufacturers' Committee, signed separte agreements with their employees. The Pejepscot Paper Company of Brunswick, Me., arranged a contract reducing the wages of skilled labor by 5 per cent and reducing those of the day laborers to 35 cents an hour. The cut is said to represent an average of between 13 and 14 per cent., and a provision gives the company the benefit of any further reduction obtained by the general conference. The Spanish River Paper Mills, Ltd., of Sault Ste. Marie, Ont., agreed to a scale which is virtually that of the contract that expired on May 1, but with some slight reductions and a reclassification of labor. These two companies are members of the general committee. The outside company, which has signed with the unions, is the Great Northern Paper Company of Millinocket, Me. It obtained wage reductions averaging between 14 and 15 per cent. Jeremiah T. Carey, president of the skilled labor unions, said that his organization was satisfied with the agreement.

G-7 Pulp Refiner. Fr. Patent No. 520, 875, S. MILNE. **Monit. Papeterie Francaise,** lii, 720-722, (Nov. 15. 1921). A rotary disc acts in conjunction with two fixed discs, housed in a suitable casing, the pulp passing from the center of the casing towards the outside, around the rotating disc, and then from the periphery of the casing towards the center. This arrangement has a fourfold purpose: (1) to allow of treating very thick pulp, (2) to afford means of easily adjusting the distance of the fixed discs from the rotary discs, (3) to pack the shaft bearings so as to prevent loss of pulp, (4) to provide the discs with blades which are equidistant from one another and from one or more large openings for the passage of the pulp. -A. P. -C.

G-8 Feltless Wet Machine. U. S. A. Patent No. 1, 407, 398, H. R. FARNSWORTH, assignor to SANDUSKY FOUNDRY AND MACHINE CO., Feb. 21, 1921. The machine consists essentially of a perforated polygonal drum covered with wire similar to a Fourdrinier wire, each face having a suitable cover for confining a definite quantity of pulp on that face. Means are provided for intermittently rotating the drum. During the periods of rest of the drum the pulp is fed to one of the flat sides, and when the proper amount of pulp has been fed the feed is shut off and compressed air is forced under the cover, pressing the water out of the pulp. The drum is then rotated to bring the next face into position and the operations are repeated. At a suitable point the pulp is removed from the machine by blowing air outwardly through the drum face. -A. P. -C.

G-8 Cutting Blade for Wet Machines. Can. Patent No. 205, 402, J. G. CARRIER, Nov. 9, 1920. Also, Can patent No. 216, 333, March 7, 1922. -A. P. -C.

K--Paper manufacturing

K-4 Removing Printer's Ink from Paper. U. S. Patent No. 1,406,322, A. F. ALLEN et al., assignors to TIDEWATER PAPER MILLS CO., Feb. 14, 1922. Waste newspapers are macerated in an ordinary beating engine, with water, at a consistency of 6 per cent., and at a temperature of 140 degrees F. To the hot stock enough soda or other alkali is added to produce a decided alkalinity, which varies with the conditions under which the process is conducted. After beating for from 10 to 30 minutes, sufficient chipped or granular soap, preferably laundry soap, to produce a saturated solution and the beating is then continued until the oil, in the ink, is thoroughly emulsified. Sufficient cold water is then added to bring down the consistency to 3 per cent. and to reduce the temperature to 100 degrees F. The effect of the cold water is not only to thin down the solution but also to throw out of solution more less of the soap. As the beating proceeds dark soapy bubbles of oil, pigment and soap rise to the surface and are removed. A special skimming mechanism is provided which may be located at any convenient point of the beating engine. After the skimming operation the pulp is given a change of water. It is then ready for use and may be lapped on an ordinary wet machine. -I. G.

K-7 Rapid Circulation Beater. PAUL EBBINGHAUS. **Wochbl. Papierfabr.,** lii, 4155-4156, Dec. 17, 1921. In the author's experience the increased gradient from the backfall to the front of the roll seemed to have caused too great air absorption of stock and to have affected the nature of the beating. -I. G.

K-7 Heating of the Stuff in the Hollander. Papierfabr., xix, 1399-1400, (Dec. 2. 1921). Very warm stuff contains much finer flakes of the rosin size than colder stuff, consequently the particles of the size escape more easily. Warm stuff in the case of paper fiber used for spinning also results in a reduction of the strength of the fiber and on long continued beating the fibers become too brittle. In disc beaters the heating is brought about through the uninterrupted friction on one and the same surface. In this case the heating increases more rapidly the thinner the layer of charge in the machine. The production of heat increases with the width of the rubbing surface and with increasing thickness of the knives. -I. G.

K-9 Distribution of Fillers in Finished Paper. E. ALBRECHT. **Wochbl. Papierfabr.,** lii, 3441, (Oct. 22, 1921). From the behavior of ink marks on paper it is considered that the sizing and filling materials are to be found invariably near the under side, that is the wire side, of the paper. The fact that heavily loaded paper has the upper side whiter than the under side is due to the fact that the filling material, when it finally reaches the wire after travelling through the layers of stock, is carried away with the back water, so that the under surface of the paper is practically free from filling material; while on the other hand the upper surface contains some of it, even though small amounts only. -I. G.

K-10 Paper Size. Ger. Patent o. 347, 014, FARBEFABRIKE VORM. F. BAYER and CO., Jan. 12, 1922. A sizing for paper is made by the action of salts of the halogenated fatty acids on the metallic salts of cellulose, or its decomposition products. To this there are added aluminium compounds. For example, sodium chloracetate is made to react with sodium cellulose with the formation of the sodium salt of cellulose acetic acid. The paper is first immersed in this solution and then in a solution of formate of alumina. -I. G.

K-10 Coumarone Resin as Paper Size. Ger. Patent No. 348, 063, RUETGERSWERKE A. G., About 100 parts of crude naphthenic acid, as obtained in the refining of petroleum, are dissolved in a caustic lye and the solution evaporated to a syrupy consistency. The sodium salt paste is melted with 100 parts of coumarone resin. The product will emulsify easily with water. In place of naphthenic acid, phenyl-ethane sulphonic acid may be used. In another example the coumarone resin is dissolved in benzine; the hot solution is shaken with sulphuric acid; the acid resin formed is removed, and the benzol solution is neutralized with soda solution. The neutralized solution is then evaporated to the consistency of a paste, and a viscous, hard, resinous mass is obtained which also emulsifies well with water. -I. G.

K-10 Sizing Paper With Bakelite. Ger. Patent No. 342, 255, HOLZVERKOHLUNGS-INDUSTRIE, A. G., Oct. 15, 1921. Addition to Ger. Patent No. 339, 594. The sizing of the paper is accomplished with alkaline solutions, which contain condensation products of phenols with aldehydes, or of naphthols and small amounts of alkali sulphites or other substances which are suitable for preventing the absorption of oxygen by the solution of resins. In general an addition of 0.5 percent of sodium sulphite to the alkaline solution of the resin is entirely sufficient to prevent discoloration, which is generally caused by the oxygen of the air, and to obtain a well sized white paper, which is faultless as far as the color is concerned. -I. G.

K-12 Electrical Drier for Paper. U. S. Patent No. 1,401,303, WM. CHAS. BALDWIN, Dec. 27, 1921. Same as Can. Patent No. 198,642. See **Pulp and Paper,** xix, 307, March 17, 1921. -I. G.

K-12 Felt-Cleaning Device for Paper Machines. U. S. Patent No. 1,406,821. E. D. BENNETT, Feb. 14, 1922. Same as Can. Patent No. 196,497. See **Pulp and Paper,** xix, 281, March 10, 1921. -I. G.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, May 16. — There is little change since the last report. Generally speaking the pulp and paper industry is in a satisfactory condition, although some sections are more active than others. The recovery in commerce is slow,—the process is in fact slower than was expected, but we are undoubtedly in a much better position than when the year opened, and there is every prospect that we shall see a still more pronounced improvement.

Newsprint is still the bright spot among the papers. Additional inquiries are to hand, but the mills are not in a position to promise much in the way of early deliveries. As we have pointed out before, the heavier placing of orders was due to abnormal conditions, and with these in view the mills will no doubt act cautiously in the matter of price. It is understood that the mills are not in favor of advancing quotations; future action will of course depend upon a variety of circumstances, but any advance in the immediate future may be regarded as very unlikely. In considering the new tariff proposals of the United States regarding pulp and paper there is one point which has not been as fully considered as some others. The McCumber Bill places newsprint on the free list, but only on condition that there is no export restriction in any way on export charge of any kind upon printing paper, wood pulp, or pulpwood. In the event of such restrictions or charges the President may issue a proclamation, and thereupon a duty of 10 per cent will be levied together with an amount equal to the highest export duty or other export charge upon either an equal amount of printing paper or an amount of wood pulp or wood for use in the manufacture of wood pulp necessary to manufacture such printing paper. Inasmuch as our provinces prohibit the export of pulpwood cut from Crown lands, Canada would come under the penalty clause referred to. Mechanical pulp is also on the free list, but here again the penalty clause is added.

In fine and book papers, the demand is not out of the way, but it keeps on a fairly good level. Wrapping papers are not as brisk as heretofore, while boards command a steady trade.

The pulp section is a little more active. Orders for bleached are coming in at a good rate, but other descriptions are inclined to be slow. The competition of European producers is still a consisderable factor. Groundwood is as slow as ever.

Toronto Topics

There's a certain monotony in all discsussions of trade conditions at this time, whether it be underwear, or wrapping, silks, tissues, or neckwear, book and writing paper, or bathing suits. As to the latter, most folks seem to be making their last year's suit serve another season, and there's ground for the belief that the practice of making two seasons do when one did before, has been spreading. According to all accounts, stocks must be depleted. They are not being replenished. Hence the conclusion that folks are making things last longer or making them over.

Apart from wrappings, the paper industry is in the favorable position of not handling products whose use can be prolonged without another trip through the mill, but the use of paper depends in some measure on the volume of retail trade. This is only very gradually improving.

Hopes were expressed recently that trade would brighten as the roads hardened, but whatever improvement from this source there may have been, the roads factor is off now, as most districts are in fair condition as to roads. The same was said with reference to fine weather. These factors which usually bring on quite appreciable accelerations of business, have appeared to contribute very little to the number or volume of orders at rural points in Ontario. It is being conceded here that little improvement can be expected until the late summer or fall ,more likely the fall, owing to the serious financial setbacks of the farming communities.

Trade being in this state, it is not surprising that competition is keen, requiring salesmanship of the highest order, not the easy-going back-slapping methods of a couple of years ago, but serious study of needs and purposes. One of the results of present conditions is that there is a tendency to make lower grades of stock fill the bill. This is markedly apparent in the printing and stationery trades at least in this city.

Price conditions are practically unchanged. Groundwood is firm and there is suggestion of stiffening.

With sulphite mills running in most cases at 75 per cent to 80 per cent capacity there is naturally a strongly competitive condition, some advantage ensuing to mills within short rail or truck haul of converting mills.

Coated paper is in slightly improved demand.

The book and writing market is quiet though one or two mills report fair business. A somewhat improved condition is reported from the United States and should be reflected here shortly. Wholesalers in high grade writing can see no definite reason for the present condition apart from the generally slow state of business.

Tissues and allied products are showing fair activity.

Conditions in the paper stock market are unchanged since last week with prices at approximately the same levels. There has been a slight increase in the price of books and magazines and soft white shavings in the States but this has not yet reacted on the Canadian market.

Cotton Rags of all description are nominal with small shipments going forward at last week's prices.

NEW YORK MARKETS

New York, May 13—(Special Correspondence)—The tone of the paper market continues fairly firm and there is a good business transpiring. On all sides are signs of consistent improvement and of the market developing a healthier position. Demand for most kinds of paper is expanding, gradually, to be sure, but nevertheless steadily, and reports almost without exception are to the effect that the industry as a whole is characterized by more activity and greater stabilization than in a long time.

One of the gratifying features of the present situation is that demand is almost entirely against direct requirements. Consumers are not buying paper except for direct use, and jobbers in turn are placing orders with mills mainly for supplies required to provide for customers wants. There are no indications of anyone stocking up in paper, with the possible exception of some newspaper publishers, who, fearing that a strike may be called by the operatives of print paper mills, are laying in some lots of newsprint against forward needs. Demand for fine papers, for wrapping, tissue, book and specialties and for box boards is chiefly to cover immediate wants, and there is little doubt that nearly all the paper being shipped out by mills is moving direct into consumption. Members of the trade point out that if demand has expanded as much as it has in recent weeks with buyers operating in such cautious fashion, it is to be expected that when the old system of buying ahead is revived demand will undergo still further broadening.

Newsprint manufacturers and representatives of employees in print paper and pulp mills have conferred in New York this week, and a new agreement has been reached on the question of wages, hours and working conditions. This agreement was signed by the union leaders representing the skilled workers, whereas those appearing for the unskilled workers refused to put their names on the document. The manufacturers compromised their demands and agreed to maintain present wages and working schedule for skilled operatives provided a cut in wages of the unskilled men, to be made in accordance with conditions in their respective localities, was acceptable. This proposal met with the favor of those union delegates representing the skilled workers but was turned down by the other delegates; however, the agreement was signed by a majority of the union representatives, and danger of a strike in newsprint and pulp plants seems warded off. Unskilled workers may strike, but, as pointed out by the paper mill owners, this would not necessitate the closing down of mills, while it is felt that the unskilled laborers will ultimately accept the new agreement.

Newsprint continues in a firm market position. There is a good demand from publishers who are buying with apparent freedom and who are consuming a large tonnage of paper at present. Latest figures pertaining to advertising in daily newspapers in the States, the size of issues and number of circulation are very bullish, and show that newsprint consumption is running at a high level, which, of course, is reflected in the heavy movement of supplies from mills to consuming centres. Prices are firm, with spot lots of standard news bringing in most cases slightly above the contract price of 3.50 cents a pound f. o. b. mills. Side runs are wanted in good amounts and at steady prices, while there is a consistently good demand for sheet news.

Consumption of book paper is slowly though surely growing and is being reflected at manufacturing centres. Mills are procuring more orders and are gradually increasing their production. Book papers are still in an irregular quotable position, however, Manufacturers are competing for business and are not permitting price to stand in the way of them landing orders when orders are to be had. Machine finished book is quoted at 5.75 to 6 cents a pound, and in some instances transaction have been noted at slightly below 5.75 cents.

Coarse papers are in fairly good demand. Kraft wrappings are moving in a routine manner and in moderate tonnage and prices are holding although competition from foreign sources makes for an unsettled price tone. Tissues are steady in price and are moving in quantities usual for this time of the year. Fine papers are improving their market position every day. Demand is on the rise and prices are hardening as manufacturers find a broader outlet for their product. This one branch of the paper industry, more than any other, reflects the marked improvement in business and

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AND

Finnish Wood Pulp Union
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industrial conditions generally, as the larger use of bond and ledger papers shows that correspondence is increasing as business becomes better.

There is a satisfactory demand for box boards. Most board producers complain of the low prices they are obtaining for their product, but this is something for which they have only themselves to blame. Certain board manufacturers are cutting prices to land orders with the idea in view of keeping their machines running full, and it can be said that in most cases boards are being marketed at prices which mean little or no profit to producers. This policy on the part of manufacturers is gaining them nothing, instead it is doubtless causing many board consumers to hold off in buying. Present quotations on plain chip board in New York range between $32.50 and $35 a ton delivered in this city, and on news board from $35 to $37.50 delivered.

GROUND WOOD— Mechanical pulp is holding fairly steady in price, which is gratifying in view of the large production at present. In fact, it is somewhat surprising that market levels are maintained as well as they are in the face of the appreciable increase in output recently, but it is presumed that newsprint mills are using enough ground wood to sustain prices and to keep the market from becoming overrun with supplies. Domestic producers are reported quoting an average of $32 a ton at grinding plants for prime spruce ground wood, freshly ground, for prompt shipment. Sales are of course being made in some instances at under this price, but on the whole sellers are keeping quotations on a steady range of between $37 and $40 a ton delivered, with f.o.b. grinding mill prices depending largely on the distance the pulp has to be hauled.

CHEMICAL PULP—Probably the feature in chemical wood pulp is the slightly easier position of foreign bleached sulphite. Importers in New York are reported offering bleached sulphite. Importers in New York are reported offering foreign bleached sulphite of strictly No. 1 quality at 4 cents per pound on the dock, while secondary grades are available down to 3.50 cents, although around 3.75 cents is said to be a more representative market level on this kind of pulp. The downtrend in foreign bleached sulphite undoubtedly is due to the recent reduction in prices on domestic bleached sulphite, and the spread between quotations on the two kinds of pulp is today about the same as prior to the cut in prices by domestic producers.

Pulp is moving toward consumers in a more or less routine way without any important developments Quotations on other grades hold steady although proof is not wanting that manufacturers and importers are frequently accepting offers from papermakers at slightly under the prices asked. Buyers are resorting to a good deal of "shopping" in the trade before placing orders, and through this procedure are managing to pick up lots of pulp at prices which are viewed as "bargains."

RAGS— The papermaking rag market is characterized by little activity of importance. Demand is largehas been almost ignored by felt mills this week, and ly of hand to mouth variety and the aggregate movements of rags is not up to an average. Roofing stock has been almost ignored by felt mills this week, and those that have bought have had no difficulty in getting No. 1 roofing rags at around 90 cents a hundred pounds f. o. b. New York, and No. 2 packing at 80 cents with some purchases of the latter noted down to 75 cents. Old whites are moving slowly and at irregular prices,while old thirds and blues are neglected. New cuttings are held with a little more firmness by dealers but prices show no change of consequence. New No. 1 white shirt cuttings are selling fairly freely at between 9.50 and 9.7 cents qer pound f. o. b. this city

PAPER STOCK— Two or three grades of old paper are unquestionably in short supply and these are commanding firm prices. Heavy books and magazines are practically unobtainable at less than 1.40 cents a pound f. o. b. New York, and most dealers are now asking 1.50 cents for books owing to their scarcity and the strong upward tendency of prices. Soft white shavings are moving toward higher price levels, with dealers demanding 3.25 cents at shipping points, and there is a strong tone to quotations on white blank news cuttings, for which around 1.70 cents a pound is asked. Hard white shavings are quiet are quoted and at an average of 3.75 cents per pound f. o. b. New York, and there is but a limited movement of old kraft paper, ffor which sellers ask 1.50 cents for No. 1 packing. Folded newspapers are bringing 52 1-2 to 55 cents a hundred pounds New York, and No. 1 mixed paper 40 cents a hundred pounds.

OLD ROPE AND BAGGING— A steady tone marks quotations on old manila rope and dealers report having no trouble in inducing paper mills to pay 4.25 cents per pound at shipping points for rope in No. 1 condition, in fact, there have been reports of sales at higher levels. Old bagging is wanted only in routine quantities at prices ranging around a cent per pound for No. 1 scrap bagging.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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EDITORIAL

THE NEW CANADIAN TARIFF

Paper manufacturers in Canada have been looking forward with much interest and not a little anxiety to the bringing down of the tariff. No doubt manufacturers of certain grades in other countries have also been watching keenly for a possible letting down of the bars which would give them an advantage in competition with the domestic product. On Tuesday afternoon the Hon. W. S. Fielding, Minister of Finance, delivered his budget speech in the House of Commons. In the reports of the speech we find no reference made to any change in the tariff on pulp or paper and consequently assume that the import duty on these articles remains the same as before. There is a slight reduction in the tariff on paper milk bottle caps and the statement is made that that there is a revision in the drawback schedule. As no details of the latter are given we do not know whether the drawback on chemical pulp is in any way changed. It will be seen that the change in the tariff on milk bottle caps should not seriously affect the manufacture of this article in Canada.

It is not surprising that the Government left well alone in the matter of tariff on paper. There are two distinct divisions of the industry in Canada; the one comprising the manufacture of pulp and newsprint embraces a portion of the industry in which Canada has several distinct advantages. These primarily are quantities of available wood and practically unlimited supplies of water power. Both of these are fundamental to competition in other lands with manufacturers of similar products. The advantages we possess with regard to power and pulpwood largely offset our very serious disadvantages respecting long rail hauls to most of our customers. The other branch of the industry, which includes manufacturers of fine papers and paper specialties and paper boards, is in an entirely different position. In this case our mills must compete with American producers who can supply more than their own domestic requirements and have a surplus which they can advantageously dump across the line when their own market is slack and this occasional dumping would have a most serious and demoralizing effect on our own industry. The American market for these products is so large that economical production is assured by virtue of the large orders that can be handled most advantageously in the manufacturing departments; besides which the principal raw materials, rags and waste paper, are found in more abundance than in Canada. The manufacture of fine papers, book papers, specialties and paper boards, in the Dominion has developed very little in advance of actual requirements of the domestic market. It is essential that our own needs for these materials be manufactured at home for economic as well as patriotic reasons so that while the industry will feel a sense of gratitude to the Government for maintaining the measure of protection that they have had in the past, they will feel that the action has been prompted entirely by a sense of duty on the part of the authorities at Ottawa.

There has not been much change in the various rates of duty and those which have occurred are largely those which apply to articles from Great Britain. This is in accord with the general feeling in Canada that the fullest possible measure of reciprocity among members of the Empire should be accomplished. It is a pleasure to note that negotiations which give promise of being successsful are under way between Canada and Australia. The Canadian pulp and paper industry is deeply concerned in this movement and we all hope for a successful and mutually satisfactory agreement.

KILLING HOME INDUSTRIES

There is a great deal of well based anxiety in certain Canadian communities over the constantly increasing sale of Canadian timberlands to American concerns. The chief reason for this anxiety is that these sales, running anywhere from 100 to 100,000 acres, are jeopardizing the future of prosperous towns and villages where the local saw mill or other wood using industry is likely to be closed in consequence of the imminent probability of the wood being shipped to American points for manufacture into pulp and other products.

The newspaper report of the sale of a large area of timberlands in New Brunswick and Nova Scotia just the other day states that the purchaser is *expected* to erect pulp mills in these provinces. It would seem to us that a provincial government would be entirely within its rights to *require* the purchaser of timber which supplies raw material for maintaining the industries that support a Canadian community to erect or provide such plants as might be necessary to maintain such activities in these towns. If there were no other means of protecting a Canadian community from annihilation, the Government might well consider the purchase on its own account of any timberland which might be offered for sale in the province and by this increase of crown lands provide still further for a perpetual source of income to the people and at the same time provide an insurance of employment for those engaged in plants which require wood as raw material.

There is however, another way of encouraging at least partial manufacture of the wood in Canada and that is by putting an export tax on the raw wood. Intimation that the purchaser of the most recent large amount of timberland sold may erect pulp mills in Canada leads us to assume that it will be no great hardship if the pulp making departments of the American concerns were operated in this country. If this is done our wood using communities will find great relief with regard to their future. This future, with the rapidly decreasing forest resources, diminished as they are by the axe of the lumberman and the ravages of fire, insect and wind, is already becoming a matter of grave concern and to have thousands of acres of woodlands bought up by outsiders is unduly aggravating an already serious situation.

There may be some ground for argument as to the advantage of establishing in Canada, branch factories of foreign companies whose principal object is to benefit by the duty which their goods would carry if imported into Canada but there is no likelihood of contradiction to the statement that it is decidedly to the advantage of Canadians to convert our own natural raw materials to as high a state of manufacture as possible before they leave the country. The latter not only brings more money into Canada, thus enabling us to pay for our necessary purchases abroad but it furnishes employment for our population. The former, while furnishing some employment, diverts to stock holders most of whom are not Canadians, the money which would go to the Government if the goods were imported—and the consumer gets no corresponding benefit.

There may come a time and we hope there will, when our Canadian forests are in such a productive condition and so free from fire and other dangers that we can afford to export wood in any state or condition of manufacture but we are a long way from that happy state at the present time and until that condition arrives we feel it is the duty of the present generation to provide for the maintenance of the industries whose activities support our population.

SPECULATION IN PAPER STOCKS

As a rule we do not discuss stock market matters—we are not concerned with the merits or demerits of all or any of the pulp and paper stocks and shares dealt in on the markets. There is, however, one aspect of the subject which is worth some attention, in that it affects the industry as a whole. We refer to the use of pulp and paper shares as mere gambling counters, with the object of putting up prices without regard to the intrinsic value of the securities.

It is obvious that by far the greater part of the money put into the industry is for investment purposes, and that an unsettling feeling must be produced on the minds of many investors by the periodical and violent see-sawing of values caused by speculation. It is unfortunate that the paper group is one of the favorite mediums for this gambling in Canada. The pulp and paper industry has expanded to a greater extent, in recent years, than any other industry. It has done so because Canadian and American investors, mainly, believe that Canada is the logical country for the manufacture of pulp and paper—we have the timber resources, water power, transportation, and technical skill. The industry, however, can only be maintained and extended by retaining the confidence of investors, who certainly do not desire it to be the football of Stock Exchange gamblers, whose only aim is to make money out of the rise or fall of shares.

A market built up on speculation is sensitive to every report and rumor, and naturally leads to exaggerated estimates calculated to give false impressions of the condition and prospects of the industry. The recent increased activity of the paper mills, due partly to abnormal conditions, affords an illustration of the unwarranted references as to profits and prices. The interview with Mr. Geo. M. McKee published last week, and referred to briefly, gives an excellent review of the newsprint situation.

Under the stimulus of speculation, quotations of some stocks and shares have been forced up to points which are not justified by circumstances. We are anxious that the pulp and paper companies should make substantial profits, but the trade conditions have to be looked squarely in the face. We believe that in the long run it is detrimental to the industry for the securities of the companies to be run up, by speculative methods, to figures which are not based on their true values, judged by earnings, and on which dividends cannot be guaranteed.

Business is undoubtedly slowly improving, but it has not yet reached that point where it can be fairly stated that the industry, taken as a whole, is earning an adequate return on the capital employed.

One unfortunate aspect of a market, largely influenced by gambling operations, is that many unwary people are deceived, and lose money often in large amounts. The pulp and paper companies desire to stand well in the estimation of people who are seeking investments based on the merits of the various enterprises, but are not desirous of seeing the shares placed at fictitious values, owing to speculative activities, which do not make for the stability of any department of commerce.—F. H. D.

COBWEBS

Special mention should be made of the fine cooperation which the text book committee is receiving from the paper mills. Particular mention is made at this time of an order for 20 sets of the text books sent in by the Abitibi Power and Paper Co. This company has arranged with employees to purchase the books in bulk and to allow the men to pay for them on installments of $2 per month. This spreads the payment for the books over a period of a year which is much less per week than most paper makers spend on tobacco; being in Ontario of course there is nothing else but the movies for them to spend money on.

"The fence around a cemetery is foolish because those inside can't get out, and those outside don't want to get in."

Determination of The Chlorine Consumption Number of Sulfite Pulps.*

By RUDOLPH SIEBER

Translated by John L. Parsons, Hammermill Paper Company, Erie, Pennsylvania.

I. REVISION OF THE ORIGINAL METHOD.

The original method (Zellstoffchemische Abhandlungen, I, 3 (1920), 53-65; Paper, April 6, 1921) for the rapid determination of the degree of digestion of sulfite pulps is based on the fact that the more residual lignin there is in pulp, the greater is the absorption of chlorine from chloride of lime solutions. To avoid conflicting with the lignin determination of Waenting (Zellstoffchemische Abhdlg. I, 3 (1920) 65) the author has termed his method the determination of the chlorine consumption number of pulp.

Application of this method in Kramfors, Sweden, for over a year has shown that it works very well for the comparison of pulps. Nevertheless noticeable deviations of the chlorine consumption number occurred, and to such a degree that at one time all values were higher than at another, indicating differences which could not be accounted for in the quality of the pulps. Later it was evidenced that such variations appeared especially on changing to a new chloride of lime solution; yet during the use of the same solution, deviations also appeared. In contrast to the first ones, these deviations showed a gradual change and were smaller. So it may be concluded that the failure of the test is partly due to the strength of the chloride of lime solution. Later it was easily perceived that the alkalinity of the chlorine solution was the chief cause of this phenomenon.

To ascertain the influence of different alkalinities of chloride of lime solutions, the following tests were carried out. 5 gram samples of the same pulp were suspended in 250 cc. water, as in the original procedure (see appendix) together with enough chloride of lime solution to make 6 per cent. active chlorine, computed on the pulp. The reaction mixtures in the glass containers were varied by adding O.IN sodium hydroxide or O.IN hydrochloric acid. After one hour, the residual chlorine in each mixture was determined in the usual way. Pulp A and B were treated in this manner and the results are tabulated in Table 1.

TABLE 1.

			Cc. O.IN As_2O_3 required for 50 cc. of solution at end of test.	
	Alkalinity	Time	A	B
1	Neutral	60 min.	4.05	10.30
2	11.45	"	6.60	11.30
3	22.90	"	7.95	12.30
4	34.35	"	8.50	.....
5	45.80	"	9.00	12.95

NOTES:

1. The alkalinity of the reaction solution is expressed in cc. O.IN acid.
2. The amount of chlorine used in each case was 0.30 gram=16.9 cc. O.IN As_2O_3 for 50 cc. of reaction solution.
3. The alkalinity of test No. 2 represents that of the bleach solution itself without addition of acid or alkali.

These tests show quite clearly that the influence of the alkalinity of the solution especially with hard pulps (Pulp A) is quite considerable. The strongest effect occurs in the zone neutral—10 cc. O.IN alkali and the alkalinity of most of the chloride of lime solutions used in these and former tests approximates the latter value. Small variations at this point no doubt will limit very great differences in the final results. For example it was noted that the alkalinity of a strong chloride of lime solution was somewhat less than with a fairly weak solution.

A series of tests with chloride of lime solutions varying in chlorine content were carried out. For this purpose a rather hard stock (Pulp C) was used. Each solution was used immediately without any treatment, while with No. 2 the alkalinity was adjusted to exactly 10 cc. O.IN alkali by adding corresponding amounts of O.IN NaOH or O.IN HCl.

1. The Normal Alkalinity implies that the total alkalinity of the reaction liquid amounts to 10 cc. of O.IN NaOH.
2. Solution reacted acid towards phenolphthalein.

It is clearly seen from Table 2 that the alkalinity of the reaction liquid certainly cannot be left out of consideration. Chloride of lime solutions, which contain practically the same amount of active chlorine, can be quite different in alkalinity, so that perceptible variations are possible. (See solutions 4 and 5 in Table 2.) On the other hand, good consistent values are obtained under similar conditions. The chlorine content and alkalinity vary with the age of the liquor, yet in no way are they the same. At the beginning generally the latter decreases faster than the former; when the solution is nearly neutral, the chlorine titer begins a rapid decline. For this reason especially large fluctuations may be expected in passing from old solutions to freshly prepared ones when the alkalinity is not taken into account.

Upon further investigation it was found that a second factor must be considered, namely, the temperature. The room temperature, at least in previous cases, was by no means constant and its changes could not be neglected.

Two series of tests which show the influence of temperature are tabulated in Table 3. A variation is especially noticeable with pulp D.

On the basis of these observations with several pulps and different chlorine solutions, parallel tests were carried out. For normal alkalinity 10 cc. O.IN NaOH were chosen; the

TABLE 2. PULP C.

	Chlorine Solution						
Age of solution in days	1		2		3	4	5
Cc. used for test	14	21	4	4	7	4	2
Total alkali present, O.IN NaOH	21.0	39.8	17.0	38.3	42.5	28.2	27.8
Chlorine Consumption Number, unchanged	1.84	2)	4.76	11.72	11.20	9.6	11.45
Chlorine Consumption Number; based on the Normal Alkalinity	70.1	88.6	65.3	59.0	58.5	61.0	58.9
	59.8		59.7	59.5	59.2	59.8	59.6

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* Zellstoff und Papier, I, 7 (1921), 181-184.

TABLE 3.

Pulp	'emprature C	Temp. at nd of test	Chlorine Consumption Number
D, Hard Stock	16	16	78.1
	21	23	83.0 (without temp. bath)
	25	26	84.6
E, Soft Stock	20	20	29.6
	25	25	32.0

temperature was always 20 deg. C., since this is readily attained in summer.

Table 4 shows how the real independence of the nature of the bleach solution and of the present room temperature has been reached.

The solutions, which were employed, differed considerably in the amounts of active chlorine. About 17 cc. were required for the weakest solution and about 36 cc. for the strongest.

TABLE 4.

Samples	Solution 1 Age (days)	Solution 1 Cl Con. No.	Solution 2 Age (days)	Solution 2 Cl Con. No.	Solution 3 Age (days)	Solution 3 Cl Con No.	Solution 4 Age (days)	Solution 4 Cl Con. No.
Pulp F . .	0	30.5	0	30.1	.	....	.	....
(Soft) . . .	1	30.2	.	....	.	....	.	....
	2	29.9	.	....	3	30.5	3	30.2
	.	....	.	....	9	29.9	.	....
	.	....	.	....	.	....	11	29.8
Pulp G . .	0	52.6	.	....	.	....	.	....
(Hard) . .	1	52.3	1	52.0	.	....	.	....
	.	....	4	52.3	.	....	.	....
	.	....	.	....	7	52.2	.	....
	.	....	.	....	11	52.3	11	51.9
Pulp H . .	1	58.2	1	58.5	1	58.4	.	....
(Hard) . .	3	58.4	.	....	.	....	.	....
Pulp J . .	.	....	.	....	.	....	.	....
(V. Hard)	.	....	10	72.2	10	72.6	12	72.2

With these experiments it was also investigated as to how long the chloride of lime solutions could be perserved unchanged by covering with paraffin oil. For instance, it was found that with the use of oil a bleach solution remained practically unchanged over a period of ten days; the alkalinity decreased from 7.7 to 7.5 cc. O.IN. NaOH. Frequent titrations of the bleach solutions, in this way, may be avoided.

The determination of the alkalinity—oxidation with hydrogen peroxide and subsequent titration with O.IN acid—is doubtless complicated for mill use. Nevertheless this test can be very easily carried to a minimum. When there is occasion to use two chloride of lime solutions, the one strong and the other weak, generally the two are mixed to produce the alkalinity (10 cc. O.IN NaOH) desired for the test.

Five cc. of solution are sufficient for titrating the chlorine content and 25 cc. for the alkalinity. In preparing a mixed solution of the desired chlorine content and alkalinity from two chloride of lime solutions of different strengths, the following formulas are useful:

$$x = \frac{422w - 220q,}{wp - vq} \text{ and } y = \frac{250p - 422v,}{wp - vq,} \text{, where}$$

p and q are cc. of O.IN As_2O_3 equivalent to 5 cc. of the stronger and weaker solutions respectively, and v and w are cc. of O.IN acid equivalent to 25 cc. of the same respective solutions. Then x+y cc. of the mixed solution contain 0.3 gram chlorine and possess an alkalinity equivalent to 10 cc. O.IN NaOH.

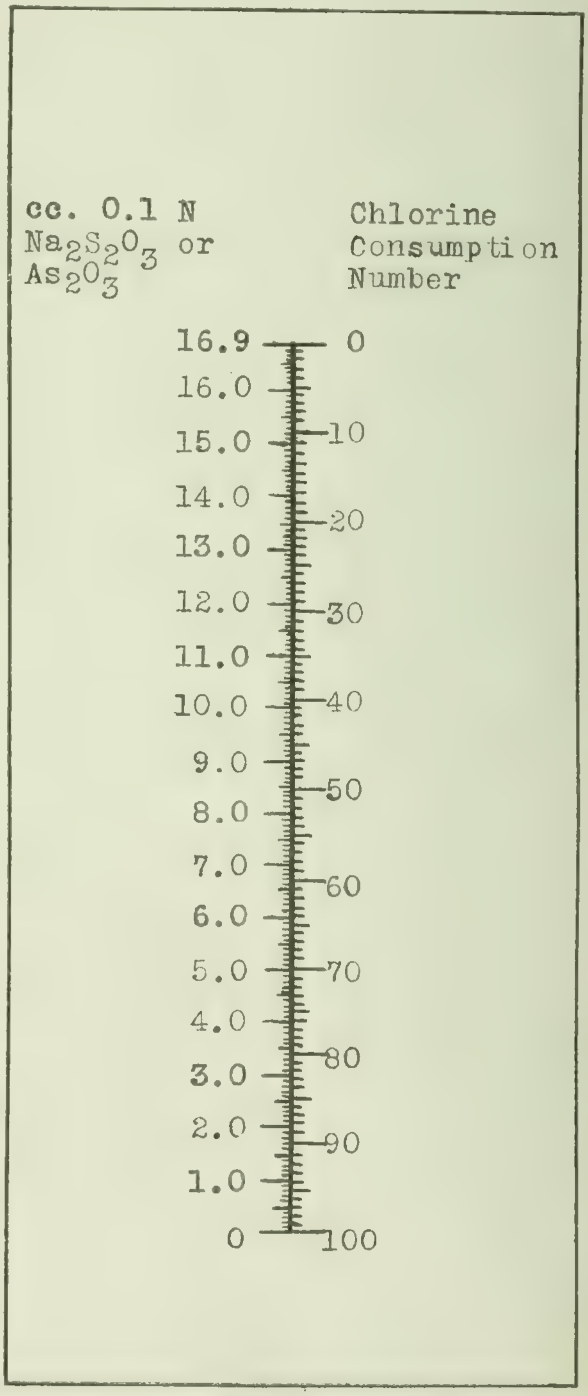
Such solutions naturally give consistent results. (See Table 5). By covering the solution with paraffin oil hardly any changes worth mentioning occur in the course of a week.

TABLE 5.

Samples	MIED SOLUTION 1 Age in days	1 Cl Con. No.	2 Age in days	2 Cl Con. No.	3 Age in days	3 Cl Con. No.
Pulp F . .	0	30.1	.	....	.	....
	3	29.9	3	29.9	.	....
Pulp G . .	1	52.0	1	52.2	.	....
	.	....	.	....	2	52.3
Pulp H . .	0	58.8	.	....	2	58.3
	6	58.6	.	....	.	....
Pulp J . .	1	72.5	3	72.2	.	....

The most suitable method of preparation is the following:

Prepare two chloride of lime solutions, using about 30 g. (per liter) of good chloride of lime for the one, and 80 — 90 g. for the second. Filter both solutions, using suction, and preserve in brown bottles to which is added paraffin



oil. The mixed solution, prepared as indicated previously, is also kept under paraffin oil in a brown bottle. This bottle may, to advantage, be directly connected to a burette so that only the necessary amount of solution is withdrawn. Mix sufficient solution to last a week, while the two original solutions should be prepared in sufficient quantity to last two weeks. Standardization of the mixed solution is unnecessary after the beginning, but the stock solutions are standardized prior to their use in preparing the mixed solution.

For greater exactness, however, repeated standardizations are necssary, for, in general, the chlorine titer and alkalinity decrease a little. The magnitude of the changes is shown by the following data: 32.1 cc. of a solution, whose alkalinity was 10.05 cc. O.IN NaOH, were required at the time of making-up; after six days, 32.3 cc. were necessary and the alkalinity was equivalent to 9.98 cc. O.IN NaOH.

SUMMARY:

1. The previously described method for the chlorine consumption number has been modified.

2. The test, to be independent of the alkalinity of the bleach solution, must be performed at a definite alkalinity of the reaction liquid, and furthermore always at the same temperature.

3. How these conditions are easily attained in practice is described.

APPENDIX:

The laboratory procedure contained in the original method (Zellstoffchemische Abhandlungen I, 3 (1920) 53-65) is as follows:

The sample of pulp, when dry, is rasped fine, and 5 grams weighed out. If the sample contains much water, this should be pressed out as much as possible by hand and 21 grams weighed for the test. 21 grams of moist pulp correspond roughly to 5 grams of dry pulp, altho the exact moisture content should be determined in a separate sample. In general with a dry pulp, a separate moisture test is unnecessary since the samples taken from the machine vary very little in their moisture content. For greater exactness, however, a special moisture test should be made.

Place the sample of pulp in a 750 cc. wide-mouthed bottle fitted with a ground glass stopper and add 150 cc. distilled water. After mixing well, allow to stand for half an hour. In this way pulp gets thoroughly soaked, the sample is made more homogeneous, and a more uniform action of the chlorine is obtained. This is naturally not necessary with a moist sample. Next, add 100 cc. of distilled water, which contains exactly 6 per cent. active chlorine computed on the pulp. For the purpose of measuring the chloride of lime solution a burette may be used, which is connected directly to the brown bottle containing the clear bleach solution. (The pulp and solution should weigh exactly 255 grams.—Trans.) The pulp is thoroughly mixed with the dilute bleach solution, using a glass rod for this purpose, and the flask stopped.

Exactly an hour after the addition of the solution, the liquid, after a thorough mixing, is filtered through a small bronze screen into a beaker. 50 cc. of the clear liquid are removed by means of a pipette and the chlorine determined in the usaul way.

Using the cc. of O.IN thiosulfate or arsenious acid required to titrate the 50 cc. sample, the chlorine consumption number may be read from the chart.* This figure then, represents the relative amount of residual lignin in the sample of pulp.

"ROMANCE OF PAPER" EXPLAINED ON SCREEN TO MOVIE AUDIENCE

The following was taken from the Montreal Star, February 23, 1922. The editor sincerely regrets not having seen the film and the "explanatory" titles. There are some decidedly novel suggestions presented.

The hornet was the first papermaker in the world, the layers of its nest, formed by the interweaving of fibres, being closely allied to the finished product of paper as we know it today. Inventions and experiments have improved the original process, and today a modern paper mill with its multitude of machinery can turn out tons of paper daily.

This and the factors employed in the production of paper were interestingly explained in the film, "Romance of Paper" shown to a very large audience at the St. Denis Theatre last night. It is the first film of its kind ever shown here and was released last night, especially for the benefit of printers and buyers of printing, through the courtesy of the United Typothetae of America and under the auspices of the Graphic Arts Section of the Canadian Manufacturers' Association.

News paper, writing paper, book pages, bank-notes and so forth owe their existence to the basic principles of isolating fibres and interweaving them. The fibres may be those of rags, which are used in making the finer paper or those of trees. The principal operations—cleaning, dusting, boiling and bleaching, are almost identical. In the former case the film showed the rags being cut into tiny squares cleansed thoroughly, reduced to pulp in a solution of lime and soda ash, bleached and drained and then hung up to dry. The sheets were then cut in the required size, packed and shipped out to the buyers.

Of greater interest, however, was the part showing the process of paper manufacture from trees, the picture opening with the marking and cutting of trees in the forest. Whole trains of logs were loaded into the sledges and drawn to the mill. In the spring the logs are carried thousands of miles down the swift rivers and when they reach the bank where the mill is situated, are drawn by a conveyor into the mill. There the bark is removed by special "barking" machines, the bolts are split and fed into a grinder. This grinder, by a tremendous force of pressure, reduces the bolts into pulp. The solution is then cooked in acid, screened to remove knobs and then bleached, after which it is run through sheets to remove the moisture and dried. At this point the coloring and the cutting into the required size are done. The final moisture is drawn off by gravity and suction, leaving it in the first form of paper.

More compressing and drying again leaves the paper in white sheets which are rolled on large cylinders, some of them weighing over two thousand pounds. These are then trimmed at the edges, split into the desired width and re-wound. Now they are ready to be shipped out to their destinations.

Some of the machines shown in the film were as high as a room, and of the most delicate and ingenious pattern. The picture proved an education even to the initiated, every factor in the making of paper not only being well illustrated but the titles also being clearly explanatory.

Other views including the most modern printing machines used and the work of classes of the Typothetae School of Printing at Indianapolis, were shown. A musical program by the vaudeville artists on the St. Denis bill concluded the entertainment.

Success in business is seldom owing to uncommon talents or orignal power which is untractable and self-willed, but to the greatest degree of commonplace capacity.—Hazlitt.

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* Zellstoff und Papier, II, 2 (1922), 29.

TECHNICAL MEN SERIOUS ON EDUCATION.

At the conference on commerical engineering education held in Pittsburg on May 1 and 2, the Technical Association of the Pulp and Paper Industry was represented by Dr. Bjarne Johnsen who has submitted a very valuable report on the proceedings.

The present practice in the different engineering schools was explained, indicating that practically all state controlled schools include in their commercial engineering course, such subjects as economics, business law, corporation finance, cost accounting and administration in addition to those on engineering proper.

It was stated that the experiment being carried on by the Massachusetts Institute of Technology in cooperating with several of the large industrial concerns in the engineering courses seemed to be very successful although still regarded as an experiment. It was stated in criticism that some of the colleges are attempting to cover too broad a range of subjects in order to turn out excutives rather than men with a thorough training in the fundamentals of engineering as a foundation for their later experience. Throughout the conference it was generally accepted that the teaching of fundamentals is the most important function of the college, at the same time to train the student to think clearly and to express his ideas in concise language rather than to attempt the production of specialists.

It was agreed that the most important requirements of an executive can not be taught in a college. The faculty of directing others and the development of ability along the lines of human relationships can only be acquired in actual experience. The reaction in general to the problem of technical training relation to the paper industry, is very ably expressed by Doctor Johnsen:

"It is important that our Technical Association very soon should take up the matter of arranging for instruction of highly trained technical men for the paper industry.

It is the pretty general impression that the colleges are "fussing" too much with their students. It may be that this is the feeling, especially with those who have been accustomed to the European schools where there is academic freedom and where the student himself is more responsible for his education. It is not a question there how he has put in on each subject and how well he has attended the lectures. It is a question how much knowledge he has acquired, not the manner in which he has acquired it. It is required from the the student before he enters the college that he have a certain practical experience and he cannot obtain a degree unless he has had sufficient practical experience in a particular line. In order to get the degree of "Diploma Engineer" in paper making it was necessary for me to have two years experience in pulp and paper mills. It was necessary in order to be admitted to the course to have at least one year of practical experience. From recent Europeon periodicals I see that the Swedish Pulp and Paper Mill Association has decided not to admit any engineer to the position of mill manager unless he has had at least twenty months' experience in a paper mill or eighteen months in a pulp mill.

"By having had this practical experience as laborer, the student has acquired some experience in contact with other men which could not have been taught in a college.

"I believe that students before entering college would have no difficulties in finding employment in the paper industry and I believe that the mills would be willing to help such young fellows along with the view of giving them as much useful experience as possible, and that they would be glad to keep in contact with the students while they are at college in order to advise them with regard to their studies in general."

GREAT CONFERENCES OF PAPER MEN

Watertown, N. Y., May 5:— More than twenty paper manufacturers of the Black River Region attended a luncheon-conference today of members of the American Paper and Pulp Association with Dr. Hugh P. Baker, Executive Secretary of the Association and other leaders in the industry, to discuss means by which the Association can be of more direct service to the mills.

Frank L. Moore, former president of the association presided, and told of his belief in the association and its work, as carried out for forty-five years.

"The association has stood for the industry as a whole for many years," he said, "and as one of the oldest trade association in American industry, has done great things to coordinate the activities of the individual mills, for the good of the industry as a whole.

"The Association," said Dr. Baker, "has accomplished much for the industry, but there is more yet to be done. One great need of this as well as of other industries, is to get and hold export markets. Only an organization representing the industry as a whole can do this work effectively, and it is for this purpose, in part, that I shall spend two months abroad this summer, with George W. Sisson, Jr., of Potsdam, studying the industry in foreign lands, so that we in America may know what conditions we shall have to meet in our efforts to improve the condition of our industry at home.

"It is part of this movement also which led to the efforts of the American Paper and Pulp Association to have a paper division established, as was eventually done, in the Bureau of Foreign and Domestic Commerce at Washington. This Division's chief object is to assist in developing our trade abroad, as well as to aid the industry at home, by such service as the government can give.

"This was one of the outstanding accomplishments of the paper industry during the elast year. The association made a most favorable impresesion in the matter of a tariff, by getting together an of the affiliated associations in a single presentation of the neeeds of the industry as a whole.

"Another important development of the year was the establishmnt of the Information Service, which is serving as a clearing house for statistical and informational material within and without the industry.

"The work of the Woodlands Section, which is just starting its second year, has been of great value, particularly in securing seasonal statistics relative to the pulpwood situation. There has been such a call for the material collected by this Section that it has been found necessary to publish and sell at a small price, pamphlets containing the information developed by this Section, though, fo course, the members of the association receive all this material as an association service.

"A few months ago the protests against the pollution of New York harbor water by oil resulted in the introduction into Congress of legislation which would close a large proportion of the nation's paper mills. The association helped prevent hasty action.

Molding of Chemical Wood Pulp with Suggestions as to Control

R. J. BLAIR, Pathologist, Forest Products Laboratories of Canada.

The molding of sulphite and sulphate pulps while in storage is an important problem for the pulp and paper industry. The first appearance of moldiness occurs as small discolored spots, many of which are often found in a single sheet. The discoloration is usually dark grey, black or brown but it may also be greenish, yellowish or a deep pink. At the outset the actual harm done to the pulp may be very slight, consisting principally in a discoloration limited to small areas. If the action is not checked the discoloration spreads until the pulp finally becomes worthless. The early discoloration may lower the price of the pulp out of all proportion to the actual damage caused as the small amount of material containing the coloring matter is so broken up in the beater that the color of the paper made from it is not appreciably changed.

All kinds of pulp may be attacked. A molded condition has been found in sulphite (bleached and unbleached), sulphate and soda pulp. Groundwood may be affected in a similar way. On examination with a microscope it is found that the pulp in the molded areas is quite different from the rest of the sheet. The difference consists in the presence of small growths attached to the pulp fibres (See fig. 1) In some cases these growths may be produced within the fibres themselves. Such growths are tiny fungus plants known as molds. The illustrations* used within this article are photomicrographs taken at a magnification of 300 diameters. If shown completely at that scale of magnification an average spruce fibre would appear about 3 feet in length.

A mold plant consists of a number of hairlike branching filaments which are many times smaller in diameter than the pulp fibres. Under conditions favorable for growth the filaments of the mold enter the spaces in the pulp sheet and attach themselves to all the fibres within a small range. The mold filaments may be colored and when a large number of these are attached to the pulp fibres a distinct spot shows up in the sheet. (See fig. 2.).

Infection

In some of the mold plants the ends of the filaments for some distance back from the tip are closely cut up into a chain-like form by the development of cross walls closely packed together. (See fig. 3). Later these sections become separated, each forming a spore. In other cases clusters of spores form in heads on small upright branches. (See figs. 1 & 2). The spores are reproductive bodies which correspond to the seeds of cultivated plants. Spores are different from seeds, however, in that they are extremely small and are produced in immense numbers. In form the spores are oval or rounded and they are so small that they float about in the air in a manner similar to germs of disease. Ultimately some of the spores come to rest in a favorable situation where they at once begin to grow. If this occurs upon a sheet of moist pulp a start has been made towards the formation of a mold spot.

Mold spores are always present in the air and they may easily come to rest upon an uneven ssurface like a sheet of pulp. Practically all pulp as manufactured is well infected before being made into paper unless run direct to the paper machine. To show the abundance of spores in the air the results of a number of observations (extending over a period of ten years) are recorded for two widely differing localities.

Mold Spores Per Cubic Centimeter Of Air

Season of year	Park Montsourie	Place St. Gervais
Winter	145	1345
Spring	195	2275
Summer	246	2500
Autumn	230	2185

In another case a circular dish 7½ inches in diameter and containing moist filter paper stood open in a garden for 12 hours. Afterwards 152 mold colonies comprising 35 different varieties developed on the filter paper. From 8 to 25 colonies of cellulose-destroying molds developed in dishes about 4 inches in diameter which stood open in a laboratory for five minutes. Recently the spore content of the atmosphere has been

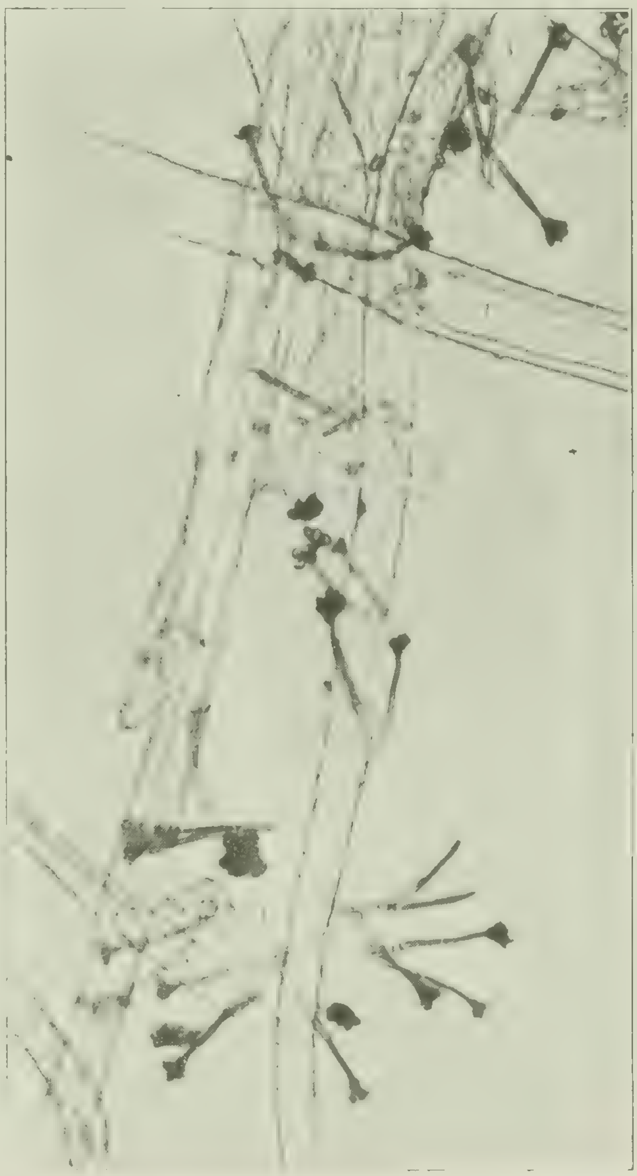

Fig. 1. — Section of a single sulphate fibre with small mold plants attached to it. The free oval black bodies are single spores. Magnified 300 times.

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*Photomicrographs by J. L. Boyd, Forest Products Laboratories of Canada.

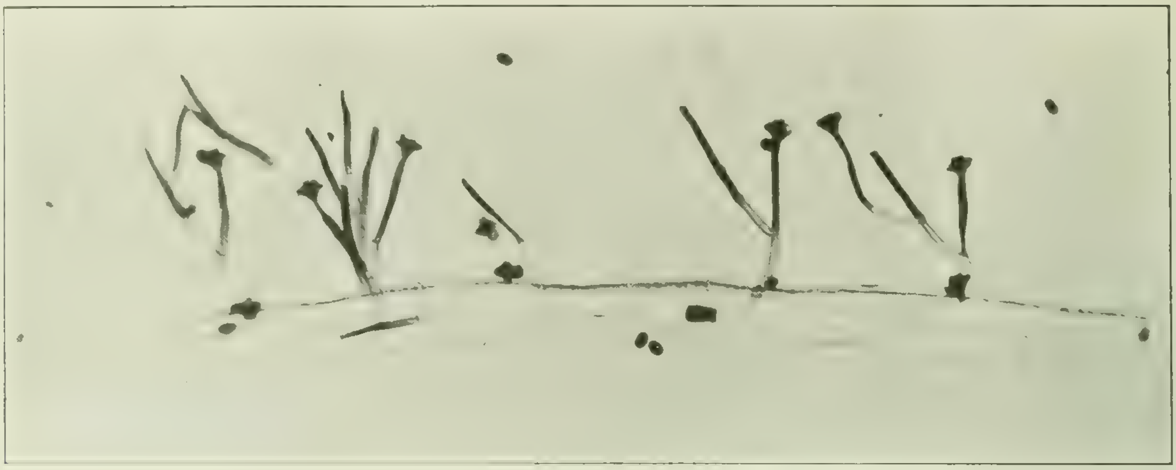


Fig. 2. — Small section of a black mold spot on a sheet of sulphate pulp. Parts of nine pulp fibree are shown. Magnified 300 times.

studied with the help of aeroplanes and it was discovered that living spores may be found at elevations of at least 11,000 feet. (It is obvious that contact with moldy pulp is not the primary cause of infection.—Ed.)

Control

In order to develop properly mold plants have certain requirements which must be satisfied. These requirements are food, air, a suitable degree of warmth and moisture and if stored in such a way that any one of these conditions is lacking pulp should be safe from attack by molds.

Examining each necessary condition in turn it is found that pulp may be protected from molding in any one of the following ways. Since it forms the food supply of the mold plant, protection may be obtained if the pulp is poisoned by treating it with some kind of antiseptic material which will remain in the pulp fibre. In the case of groundwood, sodium fluoride has been found to give good results when used experimentally for treating small quantities of pulp. Similar results are to be expected if chemical pulps were treated in the same way.

Air is necessary for the mold as it supplies oxygen for respiration. Protection may be obtained here if the pulp is stored in a warehouse where ordinary air has been replaced by carbon dioxide, nitrogen or some gas other than oxygen.

Molds also require a certain amount of warmth to develop properly, growth taking place most readily at any temperature which is comfortable for a human being. Very little growth takes place at temperatures below 35deg. F. the mold merely waiting for more

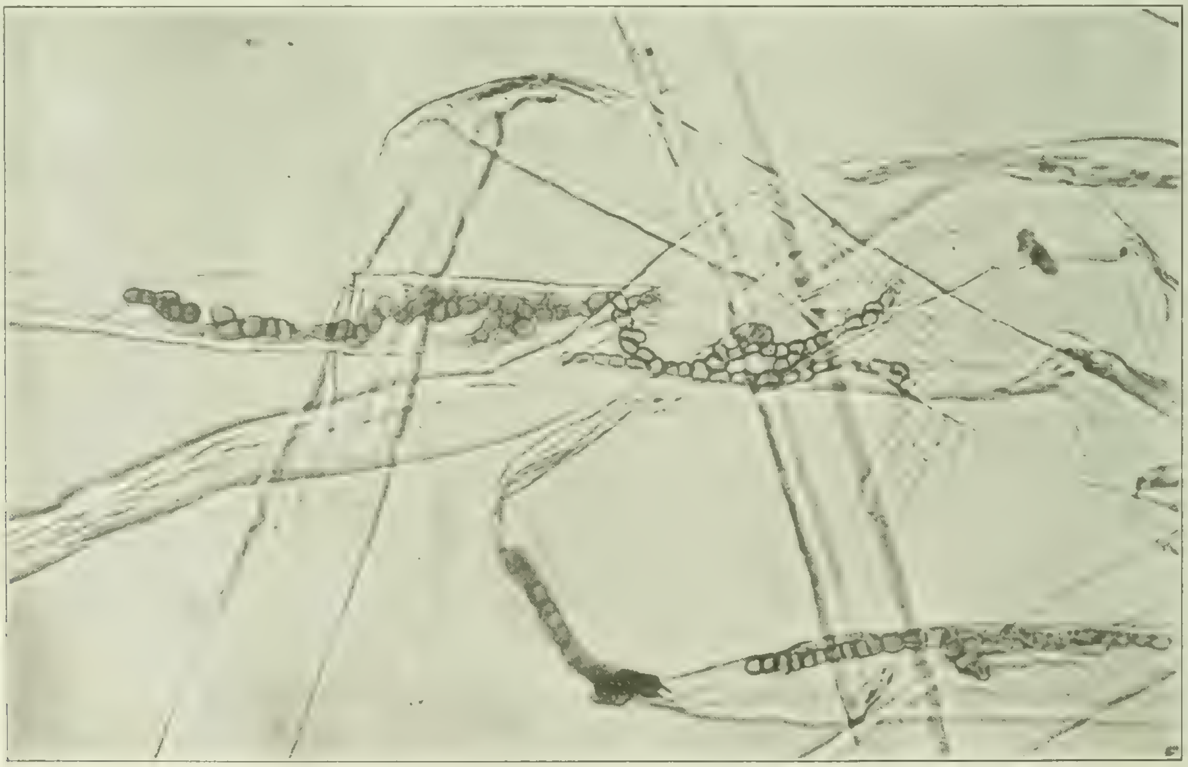


Fig. 3. — Black mold growth in bleached sulphite pulp. Parts of six pulp fitres are shown. Magnified 300 times.

warmth in order to continue its development. The effect of high temperatures depends on the condition of the mold plant and the degree of moisture present. Growth is most active at temperatures from 60 to 75 deg. F. and may continue at any temperature below 110 deg. F. Death through excess heat takes place only at temperatures much higher than this. In dry heat some very resistent spores are killed only at a temperature of 235deg. F. It has not been shown that spores can survive a temperature of 212deg. F. if immersed in water or even held in water vapor. Control of temperature to protect pulp against molding would most easily be applied by the use of cold storage. For pulp which is to be held only a few months in the winter, storage in the open is better than in a heated warehouse. The low outdoor temperature holds back the development of the mold while the warmth of the heated building encourages it.

Under ordinary pulp storage conditions moisture supply is perhaps a greater determining factor in deterioration than any of the other conditions discussed. In order to develop properly the tiny mold plants must have sufficient moisture to meet their requirements. If there is not enough moisture they cannot begin to grow and the easiest way of preventing their appearance in chemical pulps seems to lie in always drying the pulp before placing it in storage. Such valuable material as a high-grade chemical pulp should never be left in wet laps if it has to be stored for any length of time. In several instances so much mold has appeared in lapped pulp after only a few weeks storage that heavy losses were borne by the owners. No figures are available as to the exact degree of dryness at which pulp may be safely stored but a survey of conditions in mills where no trouble occurs should reveal a large amount of interesting and valuable information dealing with the subject.

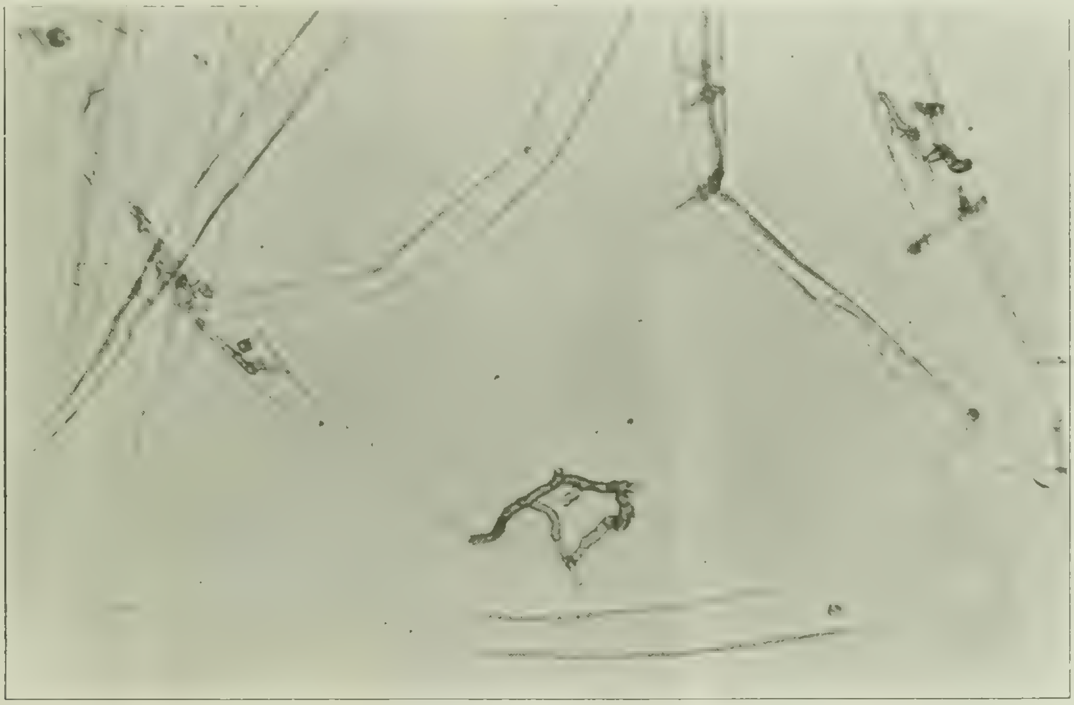


Fig. 4. — Black mold growth in soda fibres. Magnified 300 times.

SPEEDY PAPER-MAKING

Berlin, April 22.—(By mail.)—Trees on which birds warbled their morning songs are turned into newsprint paper and sold as mid-day editions on the same day in certain towns of the Harz district, says the Papierfabrikant, the leading German papermakers' organ.

The exact time taken in the process is 3 hours 25 minutes. The trees were felled at 7.35 a.m.; pulped and turned into paper by 9.39, rushed in a motor truck two and one-half miles to the printing office, and at 11 o'clock newspaper boys were crying the local sheet on the street.

Note: So the Germans are trying to beat Canadian speed records for delivery by a flank movement. They evidently made an all ground wood sheet, or "fudged" the result as regards sulphite.

The sales office of The Lincoln Paper Mills has been removed from 112 Bay St. to 43 King St. West, Toronto.

PUBLICATIONS RECEIVED

Success in Prairie Shrub Planting

Under this title the Dominion Forestry Branch has issued a very instructive pamphlet on the success that has attended the planting of shelter belts and wood lots on the prairies. From a perusal of this bulletin which is numbered 72, there is no doubt of the need for growing timber both for use as such and for its beneficial effect on the climate and on the attractiveness of the homestead. Attention is given to the kinds of trees htat may be used and the care of young trees. A number of letters are included which show very conclusively that the farmers thoroughly appreciate the value of trees and the assistance given them by the Forestry Branch and the Department of the Interior.

Don't fail to read "The Romance of Paper" on another page.

COST ASSOCIATION OF THE PAPER INDUSTRY

Program of the Seventh Semi-Annual Convention, to be hel at Community House, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., June 1st, 2nd 3rd, 1922.

THURSDAY, JUNE 1, 1922

9.00 A.M. Registration: Cost Association, Park American Hotel, Kalamazoo, Mich. Superintendents' Association, New Burdick Hotel, Kalamazoo, Mich.

MORNING SESSION

Community House, Kalamazoo Vegetable Parchment Co.

10.00 A.M. 1. Address by President Bush

2. Report by Secretary-Treasurer.

2. Report of Committee on Beater Furnish: Technical Ass'n. Chairman, J. C. Sanburn, Strathmore Paper Co. Cost Ass'n. Chairman, H. F. Miller, American Wrtg. Paper Co.

4. Report of Committee on Depreciation: Chairman, E. S. Catlin, R. B. Wolf Co.

5. Appointment of Group Cost Committees. The Cost Association recently suggested the appointment of cost committees in each group of manufacturers and has been requested by the Secretary-Treasurer of the Writing, Book, Cover and Tissue Associations and the Toilet Paper Converters' Association to appoint such committees, to consist of three reliable cost men in each group. The work to be done by these committees is important and it is hoped that very careful consideration will be given to this matter by those attending, thereby securing the appointment of the most reliable men.

AFTERNOON JOINT SESSION WITH AMERICAN PULP AND PAPER MILL SUPERINTENDENTS' ASSOCIATION

Community House, Kalamazoo Vegetable Parchment Co.

1.00 P.M. Address of Welcome, J. Kindleberger, President and General Manager, Kalamazoo Vegetable Parchment Co.

"Association Activities in the Paper Industry," Dr. Hugh P. Baker, Executive Secretary, American Paper and Pulp Association.

"An Executive's Viewpoint on the Subject of Co-operation between Superintendents and Cost Departments." Geo. A. Galliver, President, American Writing Paper Co.

"How Cost Systems Help Superintendents." C. Oliver Wellington, C.P.A., Scovell, Wellington & Co. (15 minutes will be allowed at close of address for those who wish to question speaker.)

"Cost Accounting as Relating to the Superintendents." F. M. Hodge, President, Kalamazoo Paper Co.

6.45 P.M. Banquet, Community House, Kalamazoo Vegetable Parchment Co.

FRIDAY, JUNE 2, 1922

Morning Session, Community House, Kalamazoo Vegetable Parchment Co.

10.00 A.M. "A Simple Cost System for one or two machine Mills." Paul Koenig, Cost Accountant, Marinette & Menominee Paper Co.

GENERAL DISCUSSION REGARDING

1. Cost Association's future activities.
2. Initiation of campaign for new memberships.
3. Work of Local Divisions and Group Cost Committees.
4. Executives and Cost Departments.

AFTERNOON JOINT SESSION WITH AMERICAN PULP AND PAPER MILL SUPERINTENDENTS' ASSOCIATION

Community House, Kalamazoo Vegetable Parchment Co.

1.00 P.M. 1—Short addresses by:

Felix Pagenstacher, President Bryant Paper Co.

Fred Sutherland, Sutherland Paper Company.

A. B. Thomas, Gen. Mgr., Eddy Paper Company.

"Co-operation between Superintendents and Cost Accountants". J. H. Slater, Gen. Mgr., Escanaba Pulp and Paper Co.

"How Superintendents are Benefitted by Cost Reports based on Accurate Manufacturing Data." J. A. Reilly, Manager, Cost and Inventory Department, American Writing Paper Company.

"Mill Costs from a Technical Man's Standpoint." W. G. MacNaughton, Sec'y.-Treas. T. A. P. P. I.

Other speakers will be C. A. Jasperson, Secretary Nekoosa-Edwards Paper Company, Fred C. Boyce, Wausau Paper Mills Company, E. G. Clarke, Comptroller, The Richardson Company and Ed. Coughlin, Allied Paper Mills.

6.45 P.M. Dinner-Entertainment.

SATURDAY, JUNE 3rd, 1922

Arrangements have been made whereby those wishing to do so may visit the various mills in the Kalamazoo District. All those wishing to make such visits should give their names to the Secretary-Treasurer, T. J. Burke, as soon as possible after their arrival.

Notice—Session will start promptly at hours stated.

N. B.—There is something of value for everybody. The Cost Association helps the industry, keep production expense far enough below selling price to pay your salary or wages.

BUSINESS IMPROVING

Mr. James W. Sewall, forest engineer and timber expert, with offices at Washington, D. C. and Old Town, Maine, reports that while business in his line is still quiet he is satisfied that conditions are very steadily improving. Activity in timberland purchases cannot as yet be said to exist, but some lands and timber are now being optioned with a view to purchase and operation. This is decidely different from last year at this time when the market was decidely quiescent.

Mr. Sewall has recently been on quite an extended trip through the eastern states and looks forward to a reasonably busy season. His organization has over fifty men engaged in timber cruising and valuation now, and has kept its entire force intact throughout the period of general depression.

KOREAN MILL MAKING PULP FROM REEDS

A report from Osaka, Japan, says that in a town named Kiko, in the south-eastern extremity of Korea, the Korea Fibre Industrial Company conducted by the Zuzuki and Company produces pulp made of reed. This is the only reed pulp mill in Japanese territory. It was established in 1915 and since then a considerable sum of money has been invested and spent for the study of the reed-pulp making industry. At least, this reed pulp has commenced to make its appearance in the market.

The fibre of reed is said to resemble Esparto and can be successfully used in making the first class paper by mixing with wood pulp.

An Essay on Newsprint Paper

By WILLIAM CAULDWELL MUNRO,
Winner of the Technical Section Prize, 1922.

(Continued from last issue.)

The Digesting Solution of Cooking Acid

The solution used in digesting the wood is practically known as acid, technically as calcium, magnesium bisulphite solution. In a nut shell the acid is made by combining sulphur with oxygen by combustion in air forming sulphur di-oxide gas, SO_2. The sulphur gas is allowed to unite with water in the presence of limestone. The gas forms sulphurous acid with the water and acts on the limestone forming the bi-sulphite solution, which has the property of absorbing the sulphur di-oxide gas.

In detail the process and apparatus is complicated due to the many varying conditions and the corrosive nature of the product.

The sulphur, melted or crystalline, is fed in to the sulphur burners. The sulphur burners consist of hollow cylinders of iron about four feet in diameter, which rotate slowly about a horizontal axis. The ends of these cylinders are cone shaped, one end conducting the fumes to the combustion chamber and on the other is fitted a slotted cover the size of the slots of which can be varied, thus regulating the air supply as the air is permitted to pass through them.

The proper regulation of the air supply is a salient feature in the burning of sulphur. One pound of sulphur requires just one pound of oxygen for its conversion into sulphur di-oxide or, the amount of oxygen contained in approximately 54 cubic feet of air. If more air is admitted, especeially if moist, sulphuric anhydride or SO_3 is formed which corrodes the pipes and causes considerable loss of sulphur. Much excess air is also liable to cause overheating of the furnace, which should not go above 700 deg. centigrade in temperature, and consequent sublimation of sulphur, because more sulphur is vaporized than can be oxidized and the sulphur vapour passes on with the gases until it strikes the cooler where it condenses clogging the pipes and causing the formation of polythionic acids.

Sulphur di-oxide is fairly readily oxidized to SO_3 which with water, forms sulphuric acid, H_2SO_4. This sulphate radical is precipitated in the digester as calcium sulphate which is insoluble and a great nuisance. Keeping the gas cooler and pipe lines as free as possible from air leaks, eliminates to a large extent the formation of the sulphuric acid.

The sulphur gas is sucked from the combustion chamber through a cooler of lead pipe, the arrangements of which are many, though the principle for all is similar, counter current with water, the pipes for the most part being also exposed to the air. The gases, about 14 per cent SO_2, which have been cooled to near 55° centigrade pass through the suction fan and are blown into the tower system. The temperature to which the gas should be cooled is a much disputed point. Theoretically, the cooler the gas and water the more gas absorbed, consequently the greater efficiency of the acid. There are several other conditions which enter though, and if not considered waste much sulphur. These conditions will be discussed shortly.

The Jenssen System of making acid is in general use and although the system is patented, concrete towers especially, the idea is the same as that of all tower systems.

The fresh gases are blown up the "strong" tower, which is filled with limestone in pieces of foot-ball size and are met by a shower of weak acid which is sprayed in at the top of the tower. The gases go on up the tower to the top where they pass out and down through a lead pipe and then up an adjacent tower, termed "weak", to be met by a spray of pure cold water from the top which runs down through the stone in the tower. In the "weak" tower, the sulphur di-oxide forms sulphurous acid with the water. This acid acts on the limestone forming calcium monosulphite, which is insoluble, and precipitates on the surface of the stone. However, in the presence of excess SO_2 gas, the monosulphite takes up another equivalent of it, and is changed to the bisulphite, which is soluble and passes into the solution.

An acid reacts more readily upon an alkali rock at a high temperature. If the gases admitted to the tower are too cold, they together with the cold water keep the stone at such a low temperature that the monosulphite will not be properly formed and consequently the bisulphite production will inefficient. Valuable sulphur gases will escape from the top of the "weak" tower with the remaining gases in this case. If the gases and water are too warm, so much monosulphite is formed that it is less readily converted to the bisulphite.

After the fresh water has reacted with the gas and stone it flows as weak acid to the weak acid settling tank where suspended matter is removed. It is then pumped to the top of the "strong" tower and sprayed down to meet the fresh gases coming up. The towers are changed from "strong" to "weak" at intervals and vary in number according to the amount of acid required.

The "strong" acid passes from the bottom of the "strong" tower to the "strong" acid settling tank and is from there pumped to the storage tanks.

The strength in SO_2 of the acid is tested and controlled by titration and specific gravity. The total SO_2, or acid, is determined by means of titration against a tenth normal solution of sodium hydroxide, (should be iodine.—Ed.) while the free or absorbed SO_2 is found by titration against tenth normal iodine (should be sodium hydroxide.—Ed.) solution. The combined SO_2, or that which exists as alkali sulphite, is obtained by subtracting the free SO_2 from the total. Tower acid is generally around 3.5 per cent. in total SO_2, 2.15 per cent. being free and 1.35 being combined. Tower acid is weaker than the cooking acid as the gases are relieved from the digesters to the acid storage tank, strengthening the acid.

Digesting or Cooking Process

The chips are reduced to chemical pulp by the action of the bisulphite solution assisted by steam, pressure and temperature.

Wood consists principally of cellulose with an intercellular binding of lignin and resins which are complex organic substances. The object of the digesting process is to remove the binding, leaving the cellulose in fibre form which is suitable for matting into a strong sheet of paper.

Sulphurous acid itself has a vigorous hydrolytic action on the binding materials, dissolving them from the cellulose. However, this action is productive of a black sticky mass, composed to a large degree of complex acids and aldehydes which discolour the pulp. The purpose of the base in the acid solution is to react with these acids and aldehydes, forming soluble organic salts which are drained free from the residual pulp in the blow pits.

The process of cooking is carried on in large wrought iron tanks, called digesters, which are lined with plaster and acid resisting brick. The process takes on an average, seven and one-half hours for each cook, which varies according to the strength of the acid and the pressure and temperature at which the operation is carried on.

Bird's Eye View of Ontario Paper Co.

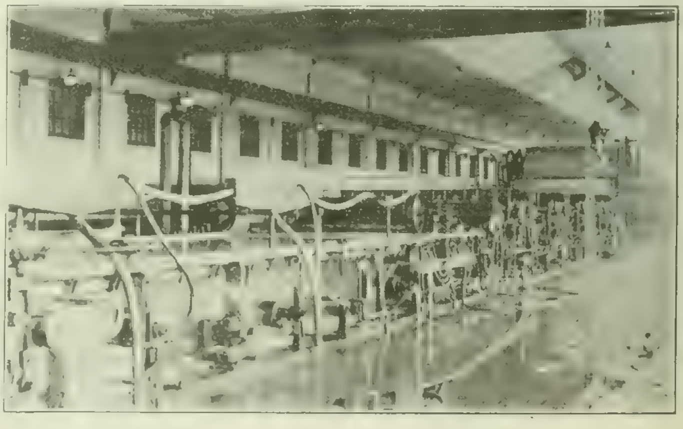
The operation consists of filling the digester through the top with chips from the storage. Pumping the digester to within a few feet of the top with cooking acid, which enters at the bottom of the digester, bolting on the head, closing all valves and turning on the steam gradually. After about two hours, a pressure of around 75 lbs. is reached and this pressure is held till the wood is cooked. If the steam pressure is turned on too rapidly, the gas is driven frm the acid without affecting the wood and a raw cook results. The steam is admitted slowly till the digester comes to pressure, 75 lbs., then the gas evolved by increase in temperature tends to raise the pressure, but this is relieved by allowing the gas to pass slowly out to the acid storage tank after being cooled. Sulphur dioxide or "cold gas" is taken off first. Then liquid and gas, termed liquor, follow until the end of the cook.

The relief gases are cooled by several designs of coolers, the "bee hive" being perhaps the most efficient. The system of handling the relief at the Ontario Paper Company's mill gave very good service and the apparatus was rather original. Up until early summer, the relief was taken off the digesters and conducted to the coolers by two inch brass pipe. The liquor passing through the pipes reacted upon them eating them through and causing leaks. This was accelerated by the large amount of gas and liquor passing through the pipes at a high pressure. These leaks caused much suffering on the part of the sulphite repair crew who had to be constantly replacing section and connections in the relief system. The cost of this labour and material was considerable. A plan was put into effect to do away with this nuisance and worked very well. The connections with the digesters remained of two inch brass pipe and were standardized for all digesters. These parts are small and easily replaceable by the "cooks". The connections lead the relief into a four inch pipe line of cast lead hardened with a small percentage of antimony. This pipe line took the relief to the coolers where it was split up passing into two inch rolled lead pipes. These pipes were wrapped spirally around a wooden form placed in a concrete basin, cold water pouring over the pipes and down into the basin, and were about a hundred feet long. The relief came from these pipes into another single four inch cast lead line which took it to the storage tanks. The addition of this four inch line eased the pressure and greatly facilitated the relieving of the digester and also was not acted upon by the liquor and gas. A rough sketch showing the lay out of the system is appended.

Care must be taken that all the sulphur gas is not relieved from the digester before blowing. If this is permitted to happen the pulp scorches and is ruined. To safeguard this, the liquor in the digester is from time to time tested during the cook, every half hour, with tenth normal iodine solution. When the gas is nearly all taken off, and a samule of the pulp shows that it is clean and the fibres soft and well separated, the "cook" gives the signal to blow the digester. The stock is than shot out into the blow pits which have false bottoms of perforated tile. There seems to be room for improvement in the design of all modern blow pits. The waste sulphite liquor drains from the stock in the pits, generally to the sewer, unfortunately. Though much research has been done upon it, little use has been found for this by-product of the sulphite process. It is being used by several mills as an adhesive in the manufacture of cores and to seal the wrappers on the rolls of paper. However so much steam is required to evaporate it to a suitable consistency that it is doubtful if it is a paying proposition. It is looked upon with much favour as a binder in the manufacture of lignite briquettes, and seems to be fulfillng the requirements for that purpose. It contains (yields.—Ed.) about one percent by volume of ethyl alcohol, but an economical process, which has proven a success, has not been so far devised for its extraction.

The stock is sent from the pits, through the knotter, over the riffler, through centrifugal screens, is deckered or thickened and then passes to the sulphite storage tanks.

Many sulphite plants are troubled with leaky digesters. This leaking can generally be stopped by tapping through the shell of the digester where the leak occurs and forcing in, under pressure, grout, which is a thin mixture of cement, quartz and water.



A Paper Machine, Electric Drive.

The causes of many leaky digesters are due to faulty construction of the digester house. The writer noticed one fault particularly in several mills, the concrete floor of the top digester room was allowed to encase the neck of the digester completely. Now the digester is continually expanding and contracting during its operation and if free to move, will expand upwards to the extent of an inch or more. If this natural expansion is resisted by the concrete flooring, stresses are formed in the digester which strain it and leaksensue.

A space of two inches was allowed between the bottom of the floor and the digester in the Ontario Paper Cmpany's mill. A skirting of sheet lead was placed around the neck of the digester on the floor to cover the space caused, and an iron ring was bolted to and around the neck to prevent the head bolts from falling on the lead and cutting it.

Groundwood or Mechanical Pulp

Groundwood or mechanical pulp is the lowest grade of pulp manufactured. The fibres are short, have little strength and the original composition of the wood remains unchanged. It is obtained by disintegrating the wood, or cutting the fibres away from it, by means of forcing it against a large grindstone under hydraulic pressure.

Two main classes of grinders are now in use in different mills. Magazine, such as the Voith grinders, and the old style hand fed pocket grinders of which there are the three and four pocket types. Each class has its relative merits. The magazine grinders save labour and space as well as consuming less power per ton of pulp produced. The grinding conditions can be kept constant over a larger amount of pulp which tends to keep the stock uniform. On the other hand there is the high first cost, the difficulty of repairs, and the possibility of a mill shut down in case of trouble with the grinder.

The old style three pocket grinder is still in much favour. Its first cost is low and its operation is comparatively simple. Repairs are easily made and a shut down of one grinder in a battery of thirty is of no consequence. The varying conditions over thirty grinders are in the sum total so nearly constant that a uniform product results if the stones are kept in good condition. Four pocket grinders save space, their stones are larger and they produce about forty percent more pulp with an increase in power of about thirty percent. There is a tendency on the part of the grinder men, however, to feel that the fourth pocket is an extra burden and hence plug it, if they are not watched.

In the successful operation of the pocket grinders the grinder men play a large part. The pockets should be loaded with uniformly sized wood placed in the pocket so that lines perpendicular to the surface of the stone, through the centres of the logs in the layer net to the stone, pass through the centres of the corresponding logs in the upper layers. This prevents jambing of the pockets. If two large sticks are placed on the stone with a small one between them on top the wood is shoved outward toward the sides of the pocket and the pocket jams.

Some sequence of order should be followed in the filling of the pockets so that too many pockets on the same line are not off the stone at one time, as the power factor on alternating current grinding motors decreases with a decrease in load. The load on the grinders is controlled during their operation by a connection between the hydraulic pressure valve and the load ammeter.

A stone of large diameter makes more pulp than one of small diameter, but more power is required to overcome the greater turning moment of the larger stone. As the stone decreases in diameter due to wear, less power is consumed but less pulp is produced also. After the stone has worn down under a certain diameter, so little pulp is produced that the stone runs at a loss until it is replaced with a new one.

The efficient operation of a groundwood mill depends upon its superintendent and foremen. It is up to them to keep the men on the job in order that the best results may be obtained as the class of labour employed has not always the best interests of the company at heart.

Old Niagara Falls, a turner of many grindstones.

The quality of the stock is dependent upon the condition of the stone, the pressure under which and the temperature at which it is produced.

It is better to have a regular systematic dressing of the stone at set intervals rather than to go by the stock. Its appearance is often deceiving of its real condition, even under the blue glass tests of the experienced eye. The results of these tests vary a great deal according to the opinion of those making them as each one will have his own idea of good stock.

The pressure applied to the wood has great effect upon the quality of the fibre produced and varies with the texture of the stones used and the nature of the wood being ground.

A microscopic analysis of the pulp is a great help in keeping tab on the pressure applied to the wood. It is very easy to tell whether the fibres have been scraped off the log or cut off if a microscope slide is made of the pulp and stained with Herzberg's stain.

The temperature at which the stock leaves the stone is very important and the conduct of the stock on the paper machine varies with it. If the temperature of the stock coming from the stone is allowed to rise much above 170 degrees Fahrenheit, the resins in the wood are liquified, and come to the surface of the individual fibres, incrusting them with a waterproof coating which makes it difficult to form a good sheet on the wire, as well as clogging the wire and contaminating the machine clothing with pitch.

From the stones the stock is diluted with white water and passes through the "bull screen" where the major slivers are removed. It is then sent through centrifugal screens which reject the tailings or coarser pulp. The stock is then deckered or thickened and sent to the slush storage tanks or the wet machine vats.

Preparation of Furnish for Paper Machines

Sulphite and groundwood pulp slush are drawn from their respective storage tanks to a mixing tank in the proportions necessary for good newsprint stock, generally around 25 per cent sulphite and 75 per cent groundwood.

Many mills are enabled to run a furnish with much less sulphite because the printing presses on which the newsprint is to be used run at slow speed or else the owners of the presses would rather have the paper break on them than pay for the extra sulphite.

The modern high speed news presses require a paper with a high tensile strength giving a Mullen test of from 10 to 12 pounds to the square inch. Newsprint is not made for the purpose of running well over a paper machine, but for running well over a news press at about three times the speed it came off the machine. A furnish of much under 25 percent sulphite will not give a paper which will answer these requirements.

A small quantity of colour, principally Prussian blue, is added to the furnish to offset the natural colour of the groundwood. A little alum is also put in which "sets" the resins and colour as well as preventing the stock from foaming to a large extent. Clay is also generally added to give the paper extra body and a smooth finish. The amount added of the alum and clay are best varied with the amount present in the white water system.

From the mixing tank the furnish goes to the Jordan chest, through the Jordan mixing engine into the machine supply chest. After being diluted to a consistency of about 0.6 percent with white water from the wire pit the furnish or stuff passes on to the machine screens and head boxes.

The Paper Machine Room

The stock is now on the paper machine. It goes through the slice on to the wire, through the presses, dryers, and calender stack and is reeled up as paper.

The paper is then re-wound and cut to size, rolled to the finishing room where it is wrapped and shipped to the newspapers.

Fourdrinier paper machines have reached such a high degree of mechanical perfection that if the furnish of stock to a machine is good, there is little trouble in making paper.

The seasons have great effect upon the conduct of the stock on the wire. In summer, the stock is much freer, that is, sheds its water more rapidly, than in winter time. This is due to the effect of the warm water in summer on the resins of the wood. To counteract this, the grindstones are dressed with finer burrs in the summer than in winter, which slows up the stock.

It is good, from a business point of view, to leave as much moisture in the paper as possible without damaging the sheet, as paper is sold by weight. It is claimed that moist paper runs better on the news presses also. The paper from the machines of most mills is in the neighbourhood of 8 per cent moisture by weight. It is possible to leave up to 11 to 12 percent moisture, after which the paper "blackens", due to the hydration of the cellulose in the calenders.

Technical Men in the Industry

(especially we youngsters):

There are many, many problems in the paper industry to-day such as sewer waste, utilization of sulphite liquor, stock control, electric drives for paper machines, etc., wsich only those with technical education and practical experience can hope to solve. These cannot be solved without the help of those men who are actually making the paper and whose predecessors built up the paper industry to its now majestic position among the industries. These men were and are just as anxious to improve the process of paper making as the most enthusiastic technical man ever was or will be, but unfortunately they are handicapped. They were able to bring the process to a certain stage with practical knowedge, but were unable to advance further. They realize their handicap and are willing that those who are better fitted should carry on, but they expect, and only rightly so, that they will receive respect and credit for their share of the work. The practical paper maker is always ready to adopt any idea or suggestion which is in the best interest of the process, if that idea or suggestion is explained to him in familiar language which he can understand, and not in terms of cosines, integrals and derivatives.

BUDWORM HALTS CONSTRUCTION

The project to construct a pulp and paper mill in South Devon at the mouth of the Nashwaak River, which the Nashwaak Pulp and Paper Co. Ltd., have had under consideration for some time, has not been abandoned but it has received a severe setback.

The Fredericton Gleaner says that the company was about ready to proceed with the project but that the ravages of the spruce budworm in the woods on the upper waters of the Nashwaak have been such that the executives of the organization have decided it would not be wise to go on with the construction of an extensive plant involving the expenditure of several hundreds of thousands of dollars for a matter of five or possibly eight years.

During the delay it is believed the real extent of damages of the budworm will be revealed and the company will then know whether it would be prudent to proceed with building their proposed plant or not. This information was revealed by Hon. N. M. Jones, president and general manager of the Nashwaak company. He had previously let it be known that the construction of a plant which would supplement if not entirely take the place of, their present mills at St. John.

Cameron and Fraser, dealing in tissues, wrapping, and twines, who have been occupying the upper floors at 112 Bay St. have now taken over the entire building to accommodate the stock required in their expanding business.

PULP AND PAPER NEWS

A serious loss of pulpwood is reported to have been suffered by the Spruce Falls Pulp and Paper Co. through the breaking of a boom on the Kapuskasing River, that Boivin also lost a valuable boom of logs. The river is unusually high, and several bridges have been in danger.

The lumber markets in Eastern Canada have improved both as to volume of business and prices. For a considerable period spruce was sold on a low basis, but under the stimulus of increased buying, due in part to building activity. Quotations have stiffened. The outlook is favorable for a further rise. Hardwoods are slow of sale except for the better qualities. The British Government has disposed of the greater part of its very large stocks of spruce in this country. Part of it is for export to the United Kingdom.

Dr. John S. Bates, chemist of the Bathurst Lumber Company, N. B., was elected president of the Canadian Institute of Chemistry, at the annual convention, held in Ottawa last week.

Mr. C. R. Whitehead, president of the Wayagamack Pulp and Paper Company, Limited, and Mr. James W. Pyke, vice-president of the company, are on a visit to England.

HARRY FROST TO SELL TYLER WIRES

Harry Frost, who has been with the Abitibi Company for five years, has left to accept a very attractive proposition made to him by the Tyler Wire Company of Cleveland, Ohio, to sell Fourdrinier wires.

During his five years at Iroquois Falls, Frost, by close attention to his work, earned the goodwill of his superiors in the mill and by his uniform courtesy, pleasant manner, and his uprightness in all things has earned the thorough respect of every man and woman in town. His leaving will be a distinct loss to the community, says the Broke Hustler.

The Tyler Company can congratulate themselves on getting a man to sell their wires who knows all the ins and outs of a wire, who is a thoroughly practical man and able to talk the good points of a wire because of his many years of practical experience.

Harry Frost has been twelve years running a machine, and has been in the paper business altogether something better than sixteen years. Before coming to the Abitibi, he was with the International Falls mill at Berlin, N. H., and Tidewater, N. Y. He also worked with Finch-Pruyn Co., the Union Bag Co., the Kansas City Star Mill, Williamette Pulp and Paper Co., and the Crown Williamette Company, the Cliff Paper Co., Niagara Falls, and the Spanish River Co.

Mr. Frost has our best wishes for success in his new work.

PLANES FOR FOREST SERVICE

Ottawa, May 23.— Two aeroplanes left here today for the summer, having been loaned by the Air Board to the Ontario Government for fire protection. Two more will leave shortly. Those yesterday were flown by Captain Clifford McEwan and Lieut. T. Lawrence. They were going to Parry Sound and Whitney.

J. S. BATES HEADS CANADIAN INSTITUTE OF CHEMISTRY

The Pulp and Paper Industry has been further recognized as one of Canada's basic scientific industries in the election of Dr. John Bates to the presidency of the Canadian Institute of Chemistry, the representative chemical organization of Canada.

This action was taken at the annual meeting held Wednesday, May 17th, at Ottawa, during the Canadian Chemists' Convention, in which the Canadian sections of the Society of Chemical Industry and the Canadian Institute of Chemistry participate.

We extend our hearty congratulations to Dr. Bates.

JOHN S. BATES, Ph. D.

PRICE BROS.' OFFICERS RE-ELECTED

The annual meeting of Price Bros. Company took place in Quebec, May 17. After the meeting it was stated that owing to the absence of Sir Wm. Price, who is in Europe, only routine business was transacted. The officials of the company were all re-elected as follows:

President, Sir Wm. Price; vice-President, George H. Thomson and James M. McCarthy; managing director, J. Leonard Apedaile; secretary-treasurer, H. E. Price.

A fit of ill temper may hurt others, but it hurts us far worse.

Technical Section

REVIEW OF RECENT LITERATURE

E — Acid Processes of Pulp Making

E-1 Determination of the Chlorine Consumption of Pulps (as a Measure of the Degree of Digestion). R. SIEBER. **Zellstoff u. Papier**, i, 181-184, (Nov. 1, 1921). (Cf. this journal xix, 866, Aug. 18, 1921). The determination must be carried out at a definite alkalinity of the reaction solution and at a constant temperature so as to make it independent of the alkalinity of the chlorine solution. Prepare two bleaching powder solutions, the first with 30 g. and the second with 80 to 90 g. Filter and keep in Brown flasks under a little paraffin oil. By mixing these two solutions it is possible to obtain the desired alkalinity. These "mixed solutions" are stable for about a week under the oil. -I. G.

G — Treatment of Pulp

G-8 K-12 Method and Apparatus for Draining a Moist Web on a Wet-or Paper Machine. U. S. A. Patent No. 1,405, 211, A. J. HAUG, assignor to IMPROVED PAPER MACHINERY CO., Jan. 31 1922. A perforated roll is pressed against the couch roll to express the water of the layer of fiber, the water passing through the pressing roll. The latter may be made to pick the sheet of fibers off the couch roll, or may even press directly against the cylinder mould, filling the function of the couch roll. -A. P. -C.

G-12 K-24 Export Packing. C. C. MARTIN, National Paper and Type Co. **Pulp and Paper**, xx, 10, (Jan. 5, 1922). An enumeration of the varied knowledge required for properly packing goods for export shipments. -A. P. -C.

. . **G-0 Process for the Purification of Commercial Wood Pulp for the Manufacture of Special Papers or for Chemical Purposes.** Fr. Patent No. 525, 720, EXPORTINGENIEURE FUR PAPIER UND ZELLSTOFFTECHNIK G.m.b.H., June 15, 1921. **Papier**, xxv, 14-15, (Jan. 1922). The bleached or unbleached pulp, either dry or moist, is placed in a rotary digester, 50 per cent (on the dry weight of the pulp) of caustic soda, sodium sulphide, or a mixture of the two, is added, and just enough water to obtain a solution of 4 to 5 degrees Be. The air is removed as much as possible either by steaming or by displacing with an inert gas or a reducing gas, the digester is closed, rotated for some time, and then heated with steam until a pressure of 0.5 to 2.5 atmospheres is obtained and maintained for several hours. After relieving the pressure the pulp should be merely moist, and should not be bathed in liquor. The pulp is then washed thoroughly, and is heated at a consistency of about 25 per cent to 100 degrees C. in the digester which is rotated for about 4 hours. -A. P. -C.

H-4 Electrolytic Cell for the Preparation of Hypochlorite Solutions. U. S. A. Patent No. 1,409,782, D. McD. ROGERS and A. T. MASTERMAN, March 14, 1922. A. P. -C.

H—Bleach making and bleaching

H-4 Process of Manufacturing Hypochlorite Solutions. U. S. A. Patent No.1,403,993, C. F. WALLACE and J. C. BAKER, Jan. 17, 1922, A solution of the base (preferably sodium carbonate, caustic soda, or milk of lime, but any weak base as magnesia, borax, basic phosphates, etc.) is passed through an injector and chlorine gas under pressure is forced into the solution in sufficient amount to immediately react with the whole of the base. Solutions containing up to 5 per cent of available Process of Manufacturing Hypochlorite Solutions, chlorine have thus been prepared, and higher concentrations can doubtless be obtained. -A. P. -C.

H-Electrolytic Cell. U. S. A. Patent N. 1,404,387, S. M. GREEN, Jan. 24, 1922. The cell contains two endless (preferably circular and concentric) perforated cathodes covered by suitable diaphragms. The annular space between the cathodes forms the anode chamber. The space outside the anode chamber can be connected to a suction pump so as to draw the electrolyte through the diaphragms when the latter begin to get clogged up. It is claimed that this effects an increase of about 100 per cent in the output of a cylindrical cell without increase in dimensions or floor space required; the volume of the anode chamber being reduced there is a smaller volume of electrolyte in the cell at any time, which effects considerable economies when starting up or shutting down; the flow through the cathodes is more regular, improving the efficiency of the cell; and finally the life of the diaphragms is increased. -A. P.-C.

H-5 Method of Bleaching Pulp. U. S. A. Patent No. 1,409,799, GEO. M. TROSTEL, March 14, 1922. Bleach solution of suitable concentration is heated to 170 to 180 degrees F. and is allowed to act for 7 to 15 minutes on the pulp at a consistency of 18 to 20 per cent. The bleaching may be carried out in one or two stages as preferred. -A. P. -C.

H-0 Handling Liquid Chlorine. D. K. BARTLETT, Electro Bleaching Gas Co. **Paper**, xxix, No. 8, 18-19, (Oct. 26, 1921); **Paper Ind.**, iii, 1277-1281, (Dec. 1921). A discussion of the handling and storage of chlorine from a safety point of view. Danger from the gas occurs when it gets out of the container, which can take place in three ways: by explosion, by an increase of pressure (due to heat) sufficient to rupture the container, or by leaks. The first can be disregarded as chlorine is non-explosive. The second is slight owing to the high critical temperature of chlorine. A few cases of rupture of containers have occurred in the manufacturers' plants (none on record in transit or users' plants) due to the presence of foreign material in the container which reacted with the chlorine. The presence of a leak is soon detected owing to the odor of the gas, and its position can be located by means of ammonia. The gas is non-inflammable and non-poisonous, but it is a very strong irritant. Inhaling it will not cause death unless the subject remain for a long time in an atmosphere of highly concentrated gas. Local conditions affect the storage problem so that a detailed discussion of the best method of storage is useless at the present stage of the art; but the problem can be readily worked out for any particular case. -A. P. -C.

K — Machinery and Processes of Paper Making

K-2 Blistery Papers. H. POSTL. **Wochbl. Papierfabr.**, lii, 3608, (Nov. 5, 1921). Description of methods of preventing this defect. -I. G.

K-5 Pulping and Washing Engine of the Hollander Type. U. S. A. Patent No. 1,402,456, H. W. SOUTHWORTH, Jan. 3, 1922. The engine is equipped with an ordinary beater roll and bedplate, and one washing drum, the place of the second washing drum being taken by a pair of pressure rolls. When the stock reaches these rolls, most of the water is pressed out and held back of the rolls to be eliminated through the washing drum, while the stock is mixed with fresh water on the other side of the pressure rolls. -A. P. -C.

K-5 The Herrbold Waste Paper Pulper. U. S. A. Patent N. 1,391,056, WM. J. HERRBOLD, Sept. 20, 1921. **Paper, xxix, No. 12, 13-15, (Nov. 23, 1921).** The stock is fed into a horizontal cylindrical tank with suitable agitators, and from the tank is fed into a chamber provided with an internal spiral and a top plate which is weighted down and held in place by means of springs, so that a certain predetermined pressure must be exerted by the stock in the chamber to lift the top plate, on overflowing from this chamber the stock falls on a concave deflector and finally returns to the tank where it goes through the cycle over again. It is claimed that the disintegrating of the stock is very effective and rapid and is without grinding or abrading action. -A. P. -C.

K-5 Rag Shredder. U. S. A. No. 1,407,364, H. H. WALLER, Feb. 21, 1922. -A. P. -C.

K-6 Process for the Recovery of Waste Paper. U. S. A. Patent No. 1,396,227, R. A. MARR, Nov. 8, 1921. **Paper,** xxix, No. 15, 28-29, (Dec. 14, 1921). The waste paper is treated with a solution of soap (preferably soft soap, i.e., potash soap) and ammonia, heated to about the boiling point and subsequently treated in a beating engine. -A. P. -C.

K-7 Thermit Welding for Beater Shafts. Paper, xxix, No. 9, 27-28, (Nov. 2, 1921). A beater shaft at the James Leo Co., Jersey City, N. J., which broke was thermit welded, and then broke again about 1 foot from the weld. The old cast iron shaft was then cut back to the larger portion and welded to an eight-inch forged steel bar, making it stronger than it originally was. A. P. -C.

K-7 Beater Roll. U. S. A. Patent No. 1, 362, 219, G. L. BIDWELL, Dec. 14, 1920. Also Can. patent No. 215,-567, Feb. 7, 1922. Also Fr. Patent No. 531,530. The roll is built up of longitudinal segments which have bars, or knives, cast in one piece with the segment. These segments are bolted to 3 spiders (one in the middle and one at each end) keyed to the shaft, the joints between the segments being filled with lead. The ends of the roll are tightly closed by means of suitable plates. -A. P. -C.

K-7 K-11 Process and Apparatus for the Preparation of Paper Pulp. U.S.A. Patents Nos. 1,405,944 to 1,405,-947, C. W. SHARTLE, Feb. 7, 1922. These patents cover various arrangements of breaking engines, beaters and screens. A. P. -C.

K-7 The Beating of Paper Pulp. RAYMOND FOURNIER. **Papier,** xxiv, 539-542, (Dec. 1921). A general discussion of the function of beating. The author also shows how it is that cylindrical fibers, such as hemp, flax, etc., hydrate more readily than flat fibers, such as cotton, and insists on the fact that the felting power of a given material does not depend on the length and diameter of the ultimate fibers as generally prepared in the laboratory, but on the length and diameter of the beaten fibers as they are fed to the paper machine. -A. P. -C.

K-8 Method and Means for Coloring Paper. -U. S. A. Patent No. 1, 407, 247, E. B. BREWSTER, Feb. 21, 1922.. The color is sprayed through nozzles on to the web on the wire by means of compressed air, the pipe carrying the nozzles being given a reciprocating motion at right angles to the line of travel of the paper. -A. P. -C.

K-10 Engine Sizing for Paper. U. S. Patent No. 1,-401, 525, J. A. DECEW, assignor to PROCESS ENGINEERS, INC., Dec. 27, 1921. The properties of rosin and alumina precipitate used in engine sizing paper are improved by the coagulation of other colloidal materials in the presence of one of these ingredients before the other is added. The rosin soap is first brought into dilute solution in water in the presence of mucilaginous material and a coagulating agent. To this end rosin soap containing 2 per cent of glue is dissolved in water to form a 1 per cent. solution. Sufficient formaldehyde is added to render the glue insoluble in water. The mixture is then fed to the stock in the beating engine where the rosin soap is coagulated by the sulphate of alumina. Other ways of carrying out the process are described. Resulting engine size will give a better finish to the paper and will resist injury usually experienced during machine drying. Gelatin, starch products, casein, natural gums, etc., may be used instead of glue. -I. G.

K-12 Paper-Cutting Device for Paper Machines. U. S. A. Patent No. 1,402,451, W. H. SHELLINGTON, assignor to INTERNATIONAL PAPER CO., Jan. 3, 1922. The patent covers a device for cutting the web just before it leaves the driers to facilitate its introduction into the calender stack. -A. P. -C.

K-12 Cylinder and Felt for Paper Machines. Can. Patent No. 215,672 BIRD MACHINE CO., assignee of C. S. BIRD, Feb. 5, 1922. The spray pipe is given a reciprocating motion at right angles to the line of travel of the felt or cylinder, the amplitude depending on the distance between the spray nozzles. It is claimed that this effects a more thorough cleaning with a lower consumption of water and power. -A. P. -C.

K-12 Method of Removing the Web from the Wire on to the Felt. Can. Patent No. 214, 078, BAGLEY & SEWALL CO., assignee of F. W. MONAGHAN, Nov. 1, 1921. The moist web passes over a suction couch roll so designed that compressed air can be blown out of the roll along a given generator, thereby blowing the web off the wire against a small roll and from there on to the press felt. -A. P. -C.

K-12 Hardy Stock Consistency Regulator. Can. Patent No. 214, 176, MILLS WORKS & MACHINERY, LTD., assignee of GEO. HARDY, Nov. 8, 1921. Addition to Can. Patent No. 184, 950, June 18, 1918. Also U. S. A. Patent No. 1,406,009, Feb. 7, 1922. -A. P. -C.

K-12 Removing Condensed Steam from Paper Machine Dryers. U. S. A. Patent No. 1,406,991, ALFRED MacKAY, assignor to GEO. B. FERRIER, Feb. 21, 1922. The color is sprayed through nozzles on to the one inlet and one deflector rib to guide the water into the chamber, deliver the water into a chamber in one of the heads of the dryer, from which it is evacuated through one of the journals. The purpose of having more than one spiral is not to increase the capacity of the water removing means, but to prevent interference in the flow of water such as occurs when there are several inlets to the spiral. -A. P. -C.

K-12 Drive for Paper Machine Dryers. -U. S. A. Patent No. 1, 407, 154, F. A. HEADSON, Feb. 21, 1922. -A. P. -C.

K-12 The Manufacture of Woollen Press Felts. E. S. BATES, Bates and Innes, Ltd., **Pulp and Paper,** xx, 41-45, (Jan. 19, 1922) ; **Paper Trade J.,** lxxiv, No. 8, 43-46, (Feb. 23, 1922) ; **Paper,** xxx, No. 1, 7-11, 18, (March 8, 1922). A detailed description of the process of manufacture of paper machine felts and jackets, with a brief discussion of their strength and performance, and a plea for closer co-operation between the paper mills and felt manufacturers in order to enable the latter to give better service. -A. P. -C.

(continued on page 442)

UNITED STATES NOTES

Many social features marked the three day session of the National Paper Box Manufacturers' Association last week at Asheville, N. C. Delegates from all sections of the country attended. The program of diversion included a thirty mile motor ride to Chimney Rock, on Thursday, and a dance at the inn on Friday evening. Trips were made to the Vanderbilt estate at Biltmore Industries shops, where the famous North Carolina homespuns are woven. Many delegates remained in Asheville over the week end to enjoy golf and horseback riding. A number of interesting addresses were made at the business meetings of the convention. W. D. Bryson fo the Fiber Container Company of Philadelphia spoke upon "The Bonus as an Incentive to Increased Production." A. G. Bury of the Fort Wayne Paper Box Company discussed "Moral Obligations in Business." Among others addressing the convention were C. E. Wentworth, George F. Barber, H. O. Alderman, William W. Baird, E. P. Franke and Lyle H. Oleson.

Gifford Pinchot, head of the Pennsylvania Forestry Department, and one time head of the Bureau of Forestry of the United States Department of Agriculture, made a successful run last week in the Pennsylvania Republican primary for the nomination as Governor of the State. As Pennsylvania is a strong Republican State, Mr. Pinchot's election in the regular contest seems likely. Mr. Pinchot is well known to forest conservationists throughout the country. His first training after his graduation from Yale in 1889 was in forestry. While in the Federal service Mr. Pinchot for nearly a decade led the fight for the conservation of federal resources. In this he had the warm support of Theodore Roosevelt during the latter's administration. His term as Pennsylvania Forest Commissioner has been marked by energetic measures for reforestation and conservation.

A campaign in which it is intended to utilize motion pictures to help increase American newsprint exports, particularly to South American countries, is being arranged by the Information Service of the American Paper and Pulp Association. Active co-operation in the plan is being given by the United States Department of Commerce which has put a motion picture specialist in charge of the distribution of the films. Pictures, for possible distribution in South America, under governmental auspices, may be submitted by manufacturers who are willing to have them made.

A report from the Bureau of Agriculture of the Philippine Islands states that about 12,000 bales of abaca (Manila hemp) fibre are consumed monthly in making paper in Japan, and that this amount is likely to increase considerably if the market price for the fibre remains as low as at present.

A proposal that the International Brotherhood of Locomotive Firemen and Enginemen create a $5,000,000 fund to found daily newspapers in the interest of organized labor was voted down at the Brotherhood convention in Houston, Texas last Wednesday. The convention voted to indorse a joint labor press, but stated that assessments at this time would be burdensome. The President and Directors of the Brotherhood were authorized to consider a proposal to establish a jointly owned paper mill with any other labor organization willing. The recommendation of the committee considering the proposal stated that the ownership of a paper mill would constitute a tremendous financial saving, and "eliminate enormous excess profits to the paper combine."

The Little Rapids Mill of the Riverside Fibre and Paper Company has been leased by the Combined Locks Paper Company of Appleton, Wis. The plant, which turns out ground wood pulp with an eight grinder equipment, is now operating under the control of the new lesee. Its product, it is understood, will be used by the two mills of the Combined Locks Company. No change has been made in the organization at Little Rapids. It is reported that the Appleton concern also has secured a lease of the Pride Pulp and Paper Company plant at Tomahawk, Wis., where operations were resumed last week following a shut-down since late in 1921. A. J. McKay, general manager of the Combined Locks Company, declined to discuss the reported lease.

The International gathering of the American Pulp and Paper Mill Superintendents' Association to be held June 1 to 3 at Kalamazoo, Mich., will have a record attendance from all indications. The fact that a papermaking center is to be the meeting-place of the convention is appealing to the trade generally. In addition to the Superintendents' delegates, the number on hand for the gathering will be swelled to unexpected proportions by delegates to cost and technical association meetings, and an unusually large number of executives, including those from mills throughout the Valley section, have announced their intention of being on hand. Local interests of Kalamazoo are straining every effort to make a huge success of the first international convention ever entertained in that city.

The Northeastern Division of the American Pulp and Paper Superintendents' Association will hold its annual meeting this week at the Elmwood Hotel, Waterville, Maine. After the business meeting the members will be conducted on a visit through the Keyes Fibre Company plant at Fairfield and Shawmut, and the Waterville Iron Works, which specializes in pulp-mill machinery. Following a banquet there is to be a discussion on the subject of an address by Robert B. Wolf, "The advantages of Bleaching Pulp at High Densities."

A strike called May 15 in paper mills at International Falls, Minn., and Fort Francis, Ont., was settled late last Thursday afternoon. One thousand men returned to work Friday.

The week beginning May 28 is designated as "Forest Protection Week" in a proclamation issued by Governor Miller of New York State. The proclamation calls upon the citizenry to "spread broadcast the word of caution regarding forest fires," and asks all public officials, clergymen and teachers to give instruction as to the importance of forests and the necessity for their protection.

Call on a business man at business times only, and on business; transact your business and go about your business in order to give him time to finish his business.
— Duke of Wellington.

A LETTER FROM MR. J. P. BURKE OF THE PULP, SULPHITE, AND PAPER MILL WORKERS' UNION

"The Editor of the Pulp and Paper Magazine has asked me to make a statement outlining the settlement made between the so-called Carlisle group of paper manufacturers and the labor organizations. I am very pleased to have an opportunity to do this as there have been so many misleading and contradictory reports, both in the newspapers and otherwise, that it is not at all surprising that there is much confusion existing in the minds of the people generally.

The so-called Carlisle group of paper manufacturers consisted at the first conference held this spring of the following companies: Abitibi Paper Company, Spanish River Pulp & Paper Mills, Minnesota & Ontario Paper Company, Fort Frances Paper Company, St. Regis Paper Company, Hanna Paper Corporation, St. Maurice Paper Company, Tidewater Paper Company, Consolidated Paper Company and the St. Croix Paper Company.

These eleven companies employ approximately 12,000 workers, not 500,000, as has been stated in many of the newspapers. The prediction of some newspapers that there might be a strike of one-half million workers when there are only 12,000 will give the public an idea of the inaccuracy of many press reports.

During the course of negotiations with this group, three companies, the St. Croix Paper Company, Consolidated Paper Company, and the Spanish River Pulp and Paper Mills withdrew and made separate settlements.

At the first conference held, the manufacturers proposed a 10 p. c. reduction in wages for all employees receiving 54 cents or over (the so-called skilled help); the elimination of extra pay for overtime work and locality rates for all receiving less than 54 cents an hour. The proposition was rejected by the employees. Then the manufacturers submitted a proposition to continue to pay the same wages for another year for what they called the skilled help as well as allowing overtime rates for all those empoyed inside the mills,but they still insisted upon locality rates for what they termed the unskilled. This proposition was accepted by the skilled crafts but rejected by the International Brotherhood of Pulp, Sulphite and Paper Mill Workers (which includes most of the so called unskilled workers.)

By locality rates the manufacturers mean in substance that they reserve the exclusive right to fix wages for what they call the unskilled workers. As a matter of fact nearly all work in pulp and paper mills requires more or less skill, but the manufacturers insisted upon terming about 75 per cent of their employees as unskilled, and they want to engage this class of labor for the "market price" or, in other words, they want to pay men as little as they can and keep sufficient help to keep their mills in operation.

Being granted their demands, the Paper Makers and other skilled crafts signed with the manufacturers although they knew the Pulp, Sulphite and Paper Mill Workers could not accept the terms imposed upon them However, the Pulp, Sulphite and Paper Mill Workers are so strongly organized in many of these mills that they have compelled a number of these companies to enter into negotiations and it looks at this writing as if satisfactory agreements would be reached with many of them without strikes. The only strike that has so far taken place in the Carlisle group is in the Bag Factory of the Union Bag & Paper Corporation at Hudson Falls.

Outside of the Carlisle group, the organizations have made settlements and signed joint agreements as in previous years with the Great Northern Paper Company, St. Croix Paper Company, Grand Lake Bag Company, Pejepscot Paper Company, Spanish River Pulp & Paper Mills, Consolidated Paper Company, Ontario Paper Company, Port Arthur Paper Company, DeGrass Paper Company, Gilman Paper Company, Minnesota & Ontario Paper Company, Fort Francis Pulp & Paper Company and negotiations are now on with many others."

YOUR HOUSE IS AFIRE!

We are glad to reprint the following editorial from from Canadian Forestry Journal, much as we regret the condition that provoked it.

THE CANADIAN PEOPLE are the greatest forest owners in the world.

True, the United States contains three or four times as much timber as Canada, but the title to seventy-five per cent of it is vested in private persons.

The Canadian people own almost 85 per cent of the national forest area. Frequently, the timber growing on portions of that 85 per cent is leased to lumber or pulp and paper companies, but the fact of that lease does not diminish the significance of public ownersip and control of the land on which the timber grows.

Practically every lessee of timber in Canada is legally subject to whatever reasonable conservation requirements the public interest from time to time may demand. In no other part of the British Empire is the public authority so unequivocal, and nowhere else is the responsibility for what happens to the forest resources so squarely placed upon the shoulders of the common citizen. The eyes and ears of most of us are so dulled by one-sided arguments on "alienated timber berths," and charges of slicing up the "public domain" that we quite overlook the fact that Canadians continue to rule all but about fifteen per cent of the forested area.

Where Citizens Are To Blame

The weak spot in forest conservation in Canada is not that timber berths are leased to private companies but that the Canadian citizen himself burns down by wilful carelessness each summer fully five times as much timber as is cut on all the timber berths from ocean to ocean. Critical at times of the legality of company titles to a township of pine, he has not time to notice that 113 parties of Fishermen did their best to burn up the forests of the Ottawa Valley during 1921 or that 308 camping parties left nothing undone that would have turned British Columbia last year into a shambles.

To be able to say that we, the people of Canada, are the governors of our forest properties is a worth while boast, but it should not end with that. We shall profit from such an advantage only as we realize that we the owners, are also the persistent destroyers; that we, the owners have great obligations which we can properly express through a deeper interest in our Government forest protective services, and by personal cautiousness with all forms of fire while in the woods.

We have a copy of a new bulletin by the Canadian Ingersoll Rand Co., describing their type 15 single stage vertical air compressors. With the increasing use of compressed air about the paper mill we are sure that the industry will be glad to study this very convenient and compact machine.

(Continued from page 439)

K-12 Stock Consistency Regulator for Paper Machines. U.S.A. Patent No. 1,408,977, L. BOIVIN, March 7, 1922. The stock outlet from the chest supplying the paper machine is conical-shaped. A hollow copper bulb, attached to a vertical rod, is suspended in the outlet, and controls the amount of stock flowing out according to its height in the outlet. Above this is a second copper bulb, also hollow, which is attached to a suitably pivoted vertical rod. The greater the consistency of the stock, the heavier it is and the more it presses down on the upper copper bulb, thereby lowering it and decreasing the area of the outlet opening, so that the actual amount of stock delivered is kept constant. A. P. -C.

K-12 Watermarking Embossing Machine. U. S. A. Patent No. 1,408,633, P. D. PARSONS, assignor to SCOTT PAPER CO., March 7, 1922. The paper is embossed by pressing the embossing wheel on the moist web against one of the dryers, giving a sharp impression resembling a watermark. More particularly applicable to tissue paper for towels, etc. -A. P. -C.

K-12 Milkey Paper Dryer. U. S. A. Patent No. 1,387,061, J. E. MILKEY, Aug. 9, 1921. Paper xxix, No. 12, 15-17, (Nov. 23, 1921); **Paper Ind.**, iii, 1253-1254, (Dec. 1921). The paper is held between two wires and pressed firmly against a perforated roll from which air under pressure is blown through the sheet to carry away moisture. -A. P. -C.

K-12 Method of Drying Paper. Fr. Patent No. 527,975, G. C. JOLY, Aug. 5, 1921. **Papier,** xxiv, 545-546, (Dec. 1921); **Papeterie,** xliii, 1120-1122, (Dec. 25, 1921). The paper is dried on an endless wire cloth which passes over a series of electrically heated plates, which are arranged in sets above one another, the whole being enclosed in a suitable chamber. -A. P. -C.

K-12 Electrical Paper Machine Drives in Canadian Mills. J. N. STEPHENSON. **Pulp and Paper**, International Number 11, 145-147, (Dec. 1921). A brief review of the principle features of the Harland, General Electric, and Westinghouse sectionalized paper machine drives. -A. P. -C.

K-12 K-23 Process and Apparatus for the Manufacture of Corrugated Paper. Fr. Patent No. 526, 331, ARKELL SAFETY BAG CO., U. S. A. **Papeterie**, xliii, 1122-1125, (Dec. 25, 1921). Compressed air is used to press the paper against a support placed immediately in front of the corrugated device. The device can be applied to existing paper machines. -A. P. -C.

K-13 Save-All. U.S.A. Patent No. 1,409 885, E. PARTINGTON, March 14, 1922. Also Eng. patent 171,718, May 21, 1920. The back-water from the paper machines is gently introduced into a suitable chest, at or near the bottom, and is kept in gentle movement in the lower portion of the chest. The agitation prevents the fibers from settling completely to the bottom of the chest; but it does not affect the upper layers out of which the fibers settle, leaving the overflow practically clear. -A. P. -C.

K-14 Angle-Gauge Attachment for Paper Cutting Machines. U. S. A. Patent No. 1,410,519, H. STENGEL, assignor to A. J. OTTEN, March 21, 1922. -A. P. -C.

K-14 Feeding Device for Paper Cutters, Perforators, Embossers, etc. Fr. Patent No. 526,624, THIEBLE. **Papeterie,** xliii, 1035, (Nov. 25, 1921). The feeding of the paper is not uniform, as there are two dead points, and it is just at this moment that the cutter, embosser, etc., is made to act. -A. P. -C.

K-14 Paper Roll Bushing. U. S. A. Patent No. 1,408,126, H. L. MUMM, Feb. 28, 1922. -A. P. -C.

K-14 Method of Finishing Paper. U. S. A. Patent No. 1,407,611, G. W. WEATON, Feb. 21, 1922. -A. P. -C.

K-14 Corner-Cutting Gauge for Paper-Cutting Machines. U. S. A. Patent No. 1,402,540, V. T. RYBICKI and B. GREENFIELD, Jan. 3, 1922. -A. P. -C.

K-14 Indicating Device for Paper-Cutting Machines. U. S. A. Patent No. 1,402,543, F. O. SCOTT, assignor to SOUTHWORTH CO., Jan. 3, 1922. The patent covers a device for indicating or determining the position of watermarks, or the like, recurring at intervals in the web, so that the cutting operation can be regulated to insure locating the mark at, say, the center of each sheet cut from the web. -A. P. -C.

K-14 Process of Finishing Paper. U. S. A. Patent No. 1,401,980, H. H. HANSON and P. E. HODGSON, assignors to EASTERN MANUFACTURING CO., Jan. 3, 1922. The fabrics used in platers are pasted along the edges to the zinc plates, thereby greatly facilitating the handling. -A. P. -C.

K-14 Method of and Apparatus for Imparting A Pattern Finish to Paper. U. S. A. Patents Nos. 1,403,628 and 1,403,629, W. J. PRICE, Jan. 17, 1922. -A. P. -C.

K-14 P-1 Safety Device for Paper-Cutting Machines. U. S. A. Patent No. 1,408,020, W. B. MURTHA, Feb. 28, 1922. A gate is allowed to drop on the cutting table as soon as the knife begins to move; and must be raised again by hand after the stroke of the knife. -A. P. -C.

K-18 Process and Apparatus for the Manufacture of Fiber Board. Fr. Patent No. 529,682, MANLEY CHEW, Sept. 15. 1921. **Papier,** xxv, 16-17, (Jan. 1922); **Papeterie,** xliv, 27-28, (Jan. 1, 1922). Same as Can. Patents Nos. 209, 835, and 209, 836, March 29, 1921. -A. P. -C.

K-18 The Production of Leather-Board. H. POSTL. **Papierfabr.,** xix, 1358-1365, (Nov. 25, 1921); 1429-1433, (Dec. 9, 1921). Data regarding the choice and preliminary treatment of the wood, steaming, digesting, grinders, the feed to the presses and their charge, splinter catchers and screening devices, horizontal and vertical refining engines, the board machine and auxiliaries, the coloring of the product and the treatment of the spent liquor accumulated in the course of the operations. -I. G.

K-18 Mechanism for Scoring Paper Board, Pasteboard, or Fiber Board. U. S. A. Patent No. 1, 408,486, G. W. SWIFT, March 7, 1922. The scoring is accomplished by opposite lines of paired rollers, with tongues opposed to grooves, the rollers of the opposing lines being arranged so that each successive pair is slightly nearer tgether than the preceding one. The scoring is thus done gradually as the board passes through the rollers. Also, parallel scorings are made by means of opposing lines of rollers arranged radially, so that as the board progresses through them the scoring mechanisms approach one another to provide the necessary surplus material required for the formation of the scoring. -A. P. -C.

K-18 Plaster Board Composition. Can. Patent No. 215, 002, J. N. EHR, W. J. EHR, and G. W. MATTESON, Jan. 10, 1922. The composition consists of 50 per cent hard plaster, 25 per cent paper pulp, 25 per cent swamp moss pulp, which. are mixed dry. Sufficient water is added to bring the mass to a suitable plastic state to be applied with a trowel. The composition may also be formed into sheets to be nailed to a wall as in the case of common plaster board. A. P. -C.

K-18 Machine for the Manufacture of Double Face Corrugated Board. Fr. Patent No. 518, 939, GEO. W. SWIFT, **Monit. Papeterie Francaise,** lii, 752 754, (Dec. 1, 1921). -A. P. -C.

K-19 COATING Paper with Metals or Mica. R. MILLER. **Papeterie,** xliii, 1022-1025, (Nov. 25, 1921). Brief notes on the coating of paper with aluminum, tin, bronzes, and mica. -A. P. -C.

K-19 Paper Lacquering Machine. Ger. Patent No. 340 433, O. POEPPEL, July 29, 1920. The lacquering machine possesses an electrically heated coating roll. -I. G.

K-19 Preparation of Paper Coating Composition. U. S. A. Patent No. 1,407,773, J. H. RYAN, Feb. 28, 1922. Clay or whiting is mixed with water to a thin dough and ground for a suitable length of time in a ball mill. Sizing material is then added and the mixture ground for about 30 minutes more. -A. P. -C.

K-19 Manufacture of Coated Paper. WM. T. SCHENK, Champion Coated Paper Co. **Pulp and Paper,** xix, 1276, (Dec. 22, 1921). A brief and general discussion of the precautions to be taken in the coating of paper, which is considered as being a difficult art. A plea is made for a dull or semi-dull finish instead of the high glossy surface at present in vogue. -A. P. -C.

K-19 Notes on Coated Printing Paper. R. MILLER. **Papeterie,** xliii, 962-965, (Nov. 10, 1921). Practical notes on the quality of coating stock and on the proper method of coating. -A. P. -C.

K-21 Bituminous Roofing. Can. Patent No. 214, 157, BARBER ASPHALT PAVING CO., assignee of A. T. CAVEY, Nov. 8, 1921. Adhesive (preferably 90 per cent castor oil and 10 per cent gilsonite) is applied to one surface of each of two webs of saturated felt, which are pressed together with the adhesive between them, and are then given an external application of a non-sticky bituminous material having a relatively high melting-point to serve as a weather-resisting coating. When required for use the two plies are stripped apart and laid in such a manner that the adhesive will unite the overlaps. -A. P. -C.

K-22 The Manufacture of Tissue Paper For Confectionery, Etc., Papeterie, xliii, 1068-1069, (Dec. 10, 1921). A description of the manufacture of this grade of paper, with particular emphasis on various minor details essential for obtaining good results. -A. P. -C.

K-23 Impregnating Composition for Paper. U. S. Patent No. 1,401,524, J. CRESPO, Dec. 27, 1921. The composition is made up of: rosin 15,000 parts, stearin 1,500 parts, paraffin 1,500 parts, and sulphur 100 parts. These ingredients are mixed together and melted. The paper articles are dipped into the hot mixture. -I. G.

K-23 Marbled Paper. Ger. Patent No. 343,028, H. BEYER-PREUSSER and F. GLASEMANN, Oct. 27, 1921. Marbled paper with different color lines and color specks arranged alongside, or on top of, one another, of any form or size, produced with the aid of colored pencils. The dry pencil is led over the dry paper by means of a movable arm which traces a design. In a single operation it is possible to obtain any sort of design in any desired color. -I. G.

K-23 Ornamental Paper. U. S. A. Patent No. 1,403, 765, M. A. T. GILLBEE, assignor to A. M. COLLINS MANUFACTURING CO., Jan. 17, 1922. The stock is given a surface coating of casein and glue, containing satin white or clay, and while still wet colors are applied in patches by means of rollers carrying different shades or colors. The web is then subjected to the action of brushes which move sideways of the line of travel of the paper, and which soften and blend and practically obliterate the lines of demarcation between the patches. -A. P. -C.

K-23 Machine for Applying Waterproof Coating to Paper and Other Fabrics. U. S. A. Patent No. 1,410,465, C. C. GAMM, March 21, 1922. -A. P. -C.

K-23 Machine for Marbling Paper. U. S. A. Patent No. 1,405,163, M. RHEINAUER, Jan. 31, 1922. A. P. -C.

K-23 Machine for Making Stretchable Crinkled Paper. U. S. A. Patent No. 1,405,384, B. ARKELL, assignor to ARKELL SAFETY BAG CO., Feb. 7, 1922.-A. P. -C.

-23 Japanese Handmade Paper. CH. GROUD. **Papier,** xxiv, 4, (Jan. 1921; **Paper,** xxix, Nov. 11, 16-17, (Nov. 16, 1921). Translation by A. Papineau-Couture. A description of the manufacture of handmade paper from the paper mulberry in Japan. -A. P. -C.

K-23 Method and Apparatus for Making Corrugated and Wrinkled Paper. Fr. Patent No. 520,974, OTAKA FABRIC CO. **Monit. Papeterie Francaise,** liii, 16-18, (Jan. 1, 1922). The patent covers the process of and machinery for corrugating paper longitudinally and creasing or wrinkling it transversely. -A. P. -C.

K-0 Laid and Wove. DARD HUNTER, Chillicothe, Ohio. **Paper,** xxix, No. 16, 12-14, 16-18, (Dec. 21, 1921). A historical sketch of early paper-making moulds, giving the origin of the terms "laid" and "wove" paper.-A. P. -C.

L—Articles produced from pulp and paper

L-4 Carton from Fibrous Material. U. S. A. Patent No. 1, 408, 752, F. X. LIST, assignor to NATIONAL CARD MOUNTING CO., March 7, 1922. -A. P. -C.

L-4 Method and Device for Perfecting Folded Paper Boxes. U. S. A. Patent No. 1,405,139, L. E. LA BOMBARD and M. H. SIDEBOTHAM, assignors to SPECIALTY AUTOMATIC MACHINE CO. Jan. 31, 1922.-A. P. -C.

L-4 Machine for Making Boxes. U. S. A. Patent No. 1,407,331, L. E. LA BOMBARD, assignor to SPECIALTY AUTOMATIC MACHINE CO., Feb. 21, 1922. -A. P. C.

L-4 Paper Bucket. U. S. A. Patent No. 1, 407, 483, B. I. RIKE, assignor to RIKE FOLDING BOX CO., Feb. 21, 1922. -A. P. -C.

L-6 Pails, Receptacles, Etc., from Fibrous Pulp. U. S. A. Patent No. 1,407,409, A. W. HANDFORD, assignor to AMERICAN SEAMLESS CONTAINER CO., Feb. 21, 1922. A. P. -C.

L-6 Objects from Paper Fibrin. U. S. Patent No. 1,-401, 979, P. E. WINNERTZ and F. E. NEUBERT, Jan. 3, 1922. Device for making hollow articles from thin solutions of fibrin (pulp) in several coats by precipitation of these coats upon wire cloth forms. The single coatings are couched and the excess liquor is sucked off in a suitable manner. Any thickness can be obtained in the finished article by varying the number of coatings applied. Moulds are heated with electricity for the final drying operations. -I. G.

L-0 Adhesive Applying Mechanism for Paper-Bag Machines, etc. U. S. A. Patent No. 1,407,612, H. W. WHITE, Feb. 21, 1922. -A. P. -C.

L-0 Envelope-Making Machine. U. S. A. Patent No. 1, 407, 206, H. F. MARSTON, Feb. 21, 1922. -A. P. -C.

L-0 Safety Envelope. U. S. A. Patent No. 1, 407, 212, E. F. NISSEN, Feb. 21, 1922. -A. P. -C.

M—General mill equipment

M-9 Material Handling as a Factor in Eliminating Industrial Waste. H. V. COES, Ford, Bacon and Davis. **Chem. Met. Eng.,** xxv, 1096, (Dec. 14, 1921). A brief discussion of the subject illustrated by a specific example of the saving effected by the introduction of proper methods of handling materials in a certain paper mill, in which the estimated annual saving was over $60,000. -A. P. -C.

M-11 Lubrication of Paper Machine Bearings. VINCENT G. HAZARD, Pusey & Jones Co., Wilmington, Del. **Belting,** Oct. 1921; **Paper,** xxix, No. 11, 14-15, (Nov. 16, 1921). A brief discussion of problems of the paper industry in the care and selection of bearings, covering care of cast iron bearings, wood bearings, lignum vitae bearings, use of water as a lubricant for wood, and ball and roller bearings. -A. P. -C.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, May 23.—From the local point of view, the paper trade has slackened off slightly. It is in a fairly good condition, with the same characteristic which has prevailed for some time—a disinclination on the part of jobbers to buy in any large volume, which in time is the result of the same policy on the part of general consumers. We have not yet reached the position where jobbers and their customers are inclined to take any risk in buying on a large scale. It therefore follows that although the orders may be fairly good taken in the aggregate, they are split into a large number of small purchases, making for an expensive overhead.

Orders for newsprint are still coming in, and the more favorable position of this section of the industry is maintained. For stock-jobbing purposes, seemingly, the increased buying has been magnified to an extent which is greatly exaggerated to put it mildly. It cannot be too strongly emphasised that a part of the larger production is due to exceptional circumstances, and is no warrant for the many reports that prices will soon be advanced. Mr. G. M. McKee, president of the Canadian Pulp and Paper Association, has pointed out that the numerous contracts with the mills for the remainder of the year will ensure price stability, a condition which is desired by the mills and which protect the supply price to the publishers. Apart from any other consideration, an advance in price on the sign of a revival is likely to check the better demand, and even to reduce the buying to a lower level.

The feature of the other departments of the paper section is the reduction of ¾c. in kraft wrappings and small reductions in other classes of wrappings. The decision to lower prices is stated to be due to outside competition. The fine paper and book mills are quite busy, while locally the trade is fairly good. Tissues and toilets are on the slow side, and a moderate business is passing in boards.

The pulp market, as a whole, is not exactly lively. The orders for bleached sulphite continue to come in at a satisfactory rate, but the other grades are not finding a ready market. Groundwood has been on slightly better inquiry with, however, little actually doing.

Pulpwood dealers state that the demand is dead. Prices, too, are purely nominal. This condition is likely to continue until the very large stocks accumulated by the Canadian and American mills are sensibly diminished. Meantime those dealers who have stocks find themselves in an uncomfortable position.

TORONTO TOPICS

There are several encouraging features in the situation this week. In the light of generally good soil conditions, there is noted a slight improvement in collections and a brightening of business is reported from some rural communities.

Building continues to be developed in good volume in nearly all centers.

Electric equipment is experiencing steadily improving business both in actual orders and inquiries. Mill equipment reflects general tuning up. Orders coming in do not indicate any large construction work or extension of plant, but feature such things as pumps and parts, showing that gradually increased activity calls for higher production records and makes economies possible.

Interest and speculation are focussed on freight rates and tariff. The settlement of either of these questions will mean much to all forms of business here and is awaited with some misgiving, especially in cases where transportation intervenes in the various stages, which pyramids costs at each step.

NEW YORK MARKETS

New York, May 20 — (Special Correspondence) — All reports continue to tell of a consistent movement of paper of fairly broad dimensions. Consumers are coming more and more into the market and are absorbing supplies in a volume that is sufficient to give the situation a much livelier complextion than has been noted in a long time. Buying is not only against direct requirements but also to some extent for future consumption, although the average user of paper is still rather backward in anticipating his needs. Practically all kinds of paper are sharing in the activity, and while of course some are in relatively better demand than others, the movement is of a general enough character to make for improvement all around.

The marked expansion of demand for paper is naturally a reflection of improvement in various other industries. One seldom hears any further reports of dullness in any line of business; indications are that business in general is steadily increasing, and that each and every one of the basic industries of the country are sufficiently active to dispel the gloom that existed among business men up to a few weeks ago and to cause manufacturers and merchants to be much more optimistic in their views. A consensus of opinion is that business wil reach very considerable proportions during the coming fall and winter. Most business men expect that the summer will witness the usual slowing down of industry, probably not to such a great degree this year as ordinarily, but expectations for later in the year are running high, with those in the paper trade especially bullish about the fall. Many look for demand for paper of most kinds to keep up at a fairly good rate during the hot weather months, owing to the light stocks held by consumers and jobbers, and it is also expected that the customary stimulation of business in paper that occurs in the early fall will be felt earlier this year than usually because of the belief that a great many consumers will endeavor to lay in stocks for fall and winter consumption sooner than ordinarily so as to be ahead of the probable advance in prices and the likely stiffening up of the market.

There is no denying that statistically paper is in a very strong market position. Mills of the country are operating at a normal rate. and were it not for the large increase in productive capacity of the last several years, there is small doubt that paper mills in the United States would today with very few exceptions be running at full output. It must be remembered that the capacity of paper mills in this country at present is no less than 23 per cent greater than three years ago, according to the latest figures, which means that with mills operating on an average of between 80 and 85 per cent of capacity—as they are—they are producing a larger tonnage of paper than they were equipped to produce three years ago.

Newsprint is moving steadily and in good tonnage. There has been no let-up in demand since the danger of a strike of mill operatives disappeared, and one only has to look at the New York dailies from day to day to appreciate how heavy the present consumption of newsprint is. Afternoon papers are printing issues running anywhere from 24 to 38 pages almost every day, and the morning newspapers range up to 42 and 44 pages in some cases. Advertising has increased with a rush of late, which means larger issues, and it is understood on high authority that circulation of newspapers is constantly growing, particularly in those cities and towns where the price of papers has been reduced to two cents and a penny.

Book papers are in better demand, and this branch of the industry, which probably is more in need of improvement in market conditions than any other, is showing a livelier tone day by day. Periodicals and trade publications are gradually getting back to their normal size and are consuming larger amounts of paper, and while book paper mills in a majority of cases still in want of business, it can be said that they are running at a larger ratio of capacity than in a lengtthy period. Prices on book papers are not firm but they are still in want of business, it can be said that they are bottom of the market has been reached. In fact, some manufacturers are becoming more independent in their attitude and are insisting on better prices—at least prices which give them a profit in making paper. Between 5.75 and 6 cents a pound at mills is the range generally quoted on machine finished book, with super quoted at 6 to 6.25 cents and coated at from 8 cents upward.

Coarse papers are in fair demand, with the market exhibiting steady improvement. Considerable quantities of kraft wrapping continue to come into the States from European sources, which have a depressing influence on the wrapping paper industry in this country, yet domestic producers appear to be getting enough business to keep them passably busy. No. 1 domestic kraft wrapping is quoted at around 6.50 cents per pound f.o.b. mills, and the No. 2 grade at about 5.75 cents. Tissues are steady in price and are enjoying a good demand, with No. 1 white tissue quoted at an average of 90 cents a ream f.o.b. New York. Fine papers are moving well and at prices which show a hardening trend. All grades of bond and ledger papers are in much larger demand than in many months and the market bids fair to hold its improvement for some time to come. Box boards are selling in comparatively large volume although they are in an unsettled price position. The efforts of some mills to procure enough business to keep them at full capacity in the face of the tremendous increase in equipment during the past several years naturally makes for irregularity in board prices because some manufacturers are cutting prices. Between $32.50 and $35 per ton f.o.b. New York is the quotational basis named on plain chip board, and from $35 to $37.50 on filled news board.

GROUND WOOD—While everything points to available supplies of ground wood being somewhat in excess of the present requirements of consumers, this being due to the large increase in production in recent months, the market is holding its equilibrium well. Prices on mechanical pulp are far from strong, neither are they firm, nevertheless they are fairly steady. No one is pressing supplies on the market excepting in infrequent cases where the effect is more or less negligible, and sellers are maintaining quotations without

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Helsingfors, Finland

AND

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Helsingfors, Finland

much difficulty. The market basis on domestic ground wood freshly ground for prompt shipment is considered between $30 and $32 a ton f.o.b. grinding plants, with delivered consuming mill prices generally figuring out a from $36 to $38 a ton, depending on the freight. Canadian ground wood brought down to New York from Nova Scotia in schooners continues to bring around $31 a ton f.o.b. New York.

CHEMICAL PULP—There is much irregularity in chemical pulp quotations. This is due both to the efforts of sellers to dispose of pulp and also to the policy of papermakers in their buying operations at present. Consumers are doing a great amount of "shopping" about the trade before placing orders and in this way are managing to get pulp in frequent instances at cheap prices; producers and importers also leaving nothing undone in an effort to market supplies and consequently are granting price concessions. Reports have it that No. 1 foreign unbleached sulphite has been sold by importers down to 2.40 cents a pound on the dock at this port, while No. 2 imported unbleached sulphite is said to be available at 2.20 to 2.25 cents a pound, and even less. No. 1 foreign bleached sulphite holds in price at around 4 cents, with No. 2 grades bringing 3.50 to 3.75 cents. Domestic bleached sulphite of No. 1 quality is quoted at 4.50 cents at pulp mills. Kraft is quotably steady at about 2.65 cents for No. 1 Scandinavian and from 2.75 cents upward at pulp mills for No. 1 domestic kraft.

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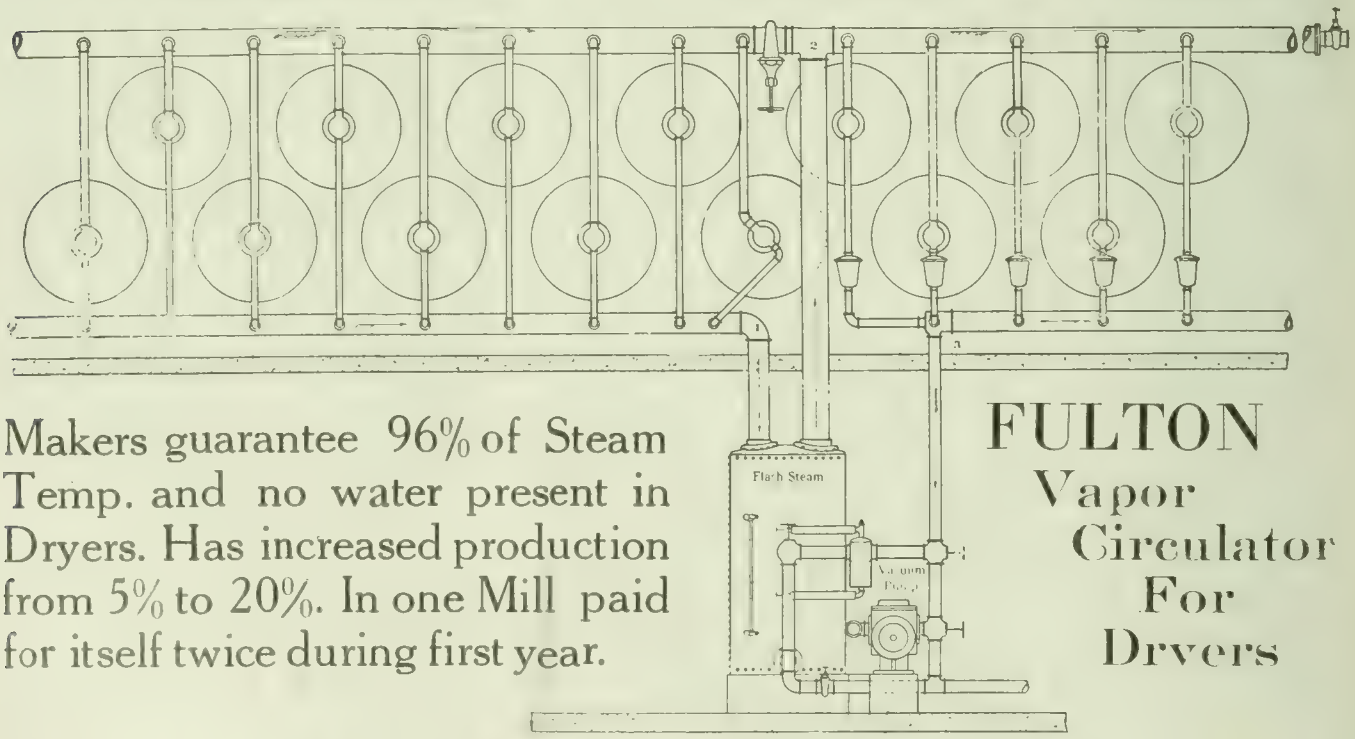

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A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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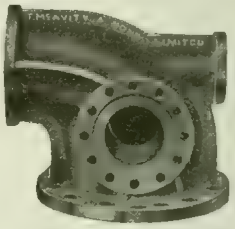

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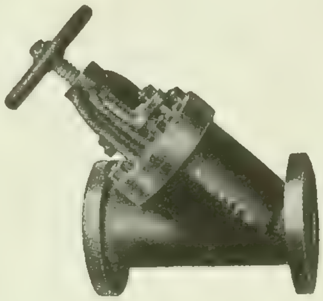

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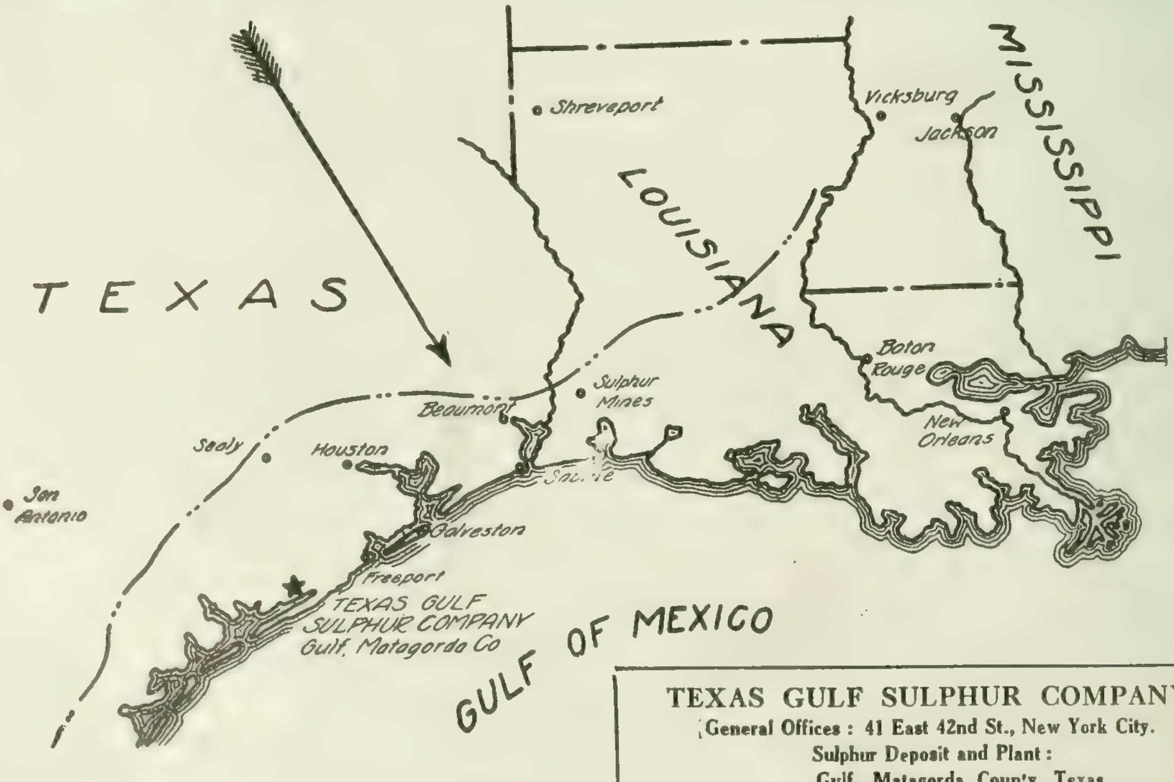

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:-: EDITORIAL :-:

HELL!

The word in our language most frequently used to express both complete condemnation and utter disgust is "Hell". The word is also used frequently to describe a disastrous situation beyond the limit of ordinary expression. It is a word which may be appropriately used as descriptive of the condition involved in a forest fire, in condemnation of the lack of measures preventive of fires, and in disgust at the general carelessness and lack of a sense of responsibility on the part of otherwise good Canadian citizens who persist in burning up our most valuable natural heritage and, in so doing, jeopardizing the existence of extensive Canadian industries and endangering precious Canadian lives. There is no other one word which so amply covers the situation which is now threatening in many parts of the Dominion.

Since the establishment of the Pulp and Paper Magazine, its editorial pages and its editorial policy have been devoted and directed to pointing out to the Canadian people the value of their vast public owned timberlands and the responsibility of each Canadian who enters the woods to do his part in protecting this asset for the use of the present and future generations. Every year, with the advent of the summer season, there comes a period of great anxiety for the welfare of the forest on the part of mill operators who look to the forest for their raw material, and on the part of thousands of employees who depend upon a continued supply of this raw material for their daily work, and on the part of foresters and rangers for the maintenance of staffs and equipment ever ready for the dread news that some fool has started a forest fire.

We sometimes wonder whether it is worth while to keep on reiterating warnings of fire in the woods but each time such a thought enters our mind we realize that Canadian industry is doomed if the forest disappears and so the fight goes on as long as there is a tree to protect.

The public must be made to see the danger in pipe ashes, cigarette butts, cigar stubs, matches, and camp fires, that are not completely and absolutely dead out. The fact that lightning and spontaneous combustion start an occasional fire is no excuse for the starting of any fire through human carelessness. If the ratio were ten to one or a hundred to one, that one fire set by man would be just as much a crime. Newspapers, magazines, organizations, and individuals with the good of Canada at heart are doing their best to reduce the sum total of human carelessness; may their efforts be blessed.

Last week the Pulp and Paper Magazine published a rousing editorial that appeared in the Canadian Forestry Magazine. It was none too strong. Canada has never faced a fire season with such an enormous hazard as the present summer. For the past two or three years and particularly the last year, the spruce bud worm has been traveling through our soft wood forests killing fir and spruce by the thousand. These dead trees are now largely pierced by wood boring insects and grubs and winds have blown down many of them so as to make the forest floor a mass of debris which is not only the worst kind of fire trap but a most efficient obstacle to the progress of fire fighters.

So we say that when fire starts in such a place Hell is none too strong a term to describe it, none too strong an expression of condemnation and disgust for the carelessness of the individual who is responsible for it.

The Remedy: Enforce the law, and keep the careless mental defectives out of the woods.

VACATION TIME

In a few weeks there will be an exodus of boys and girls from the class rooms all over the country. They are looking forward to several months of unadulterated pleasure before resuming what they consider the arduous task of absorbing knowledge. The obtaining of knowledge from books and class room exercises is hard work for most young people but they take in with pleasure and ease a great amount of knowledge by observation and experience. The vacation time approaching can be made a period of education by a little thought and planning.

It is a strange circumstance but one which has been frequently noticed, that most parents do not want their boys to follow the father's trade or business. This is apparently a case of the familiar and common notion that the other side of the street is better walking. The principal reason that fathers of today are not farther advanced in their trade or work is because they have not trained themselves for advancement and the undertaking of additional responsibilities. Many of them did not have the educational advantages which their sons enjoy, and in large part fail to appreciate. Rather than divert the boy's interest and ambition to other lines, we feel that the coming generation would be farther advanced on the road to success if the fathers of today would encourage their sons to go into the pulp or paper mill and by requiring attention to the preliminaries in school and with instruction and discussion in practical matters, enable the boy to begin about where the father is now. The vacation time can be made a period of preliminary training — a sort of probation for the older boys and we venture to assert that there are few, if any, mill managers, who would not welcome the opportunity of giving some odd job about the mill to any of those boys who might be looking towards the industry as a life work and the more odd jobs which a boy can become familiar with, the better appreciation he will have of the interdependence of departments and the necessity for dependable service throughout the plant. At the same time and not at all the least consideration, will be the fact that he will be earning a little bit at least towards covering his expenses.

We feel that the boys are entitled to and should have a good share of fun during their vacation, but it is none too good for them physically and is certainly not good mentally or morally, to loaf the whole of a school vacation. Dances, movies and the like are beneficial diversions but they are not good as a steady diet for anyone, much less for boys and girls. A couple of weeks of free time at the beginning and at the end of the holidays should be quite a sufficient break between vacation work and school work. The hours that mills now operate give a boy plenty of time for recreation and if he aspires to a position on a football or other athletic team, the hardening of his muscles by work in the mill yard, on a machine or in the garden, will be an advantage. The greatest benefit, however, will come in his increased familiarity with manufacturing processes and most particularly in discovering whether or not he has a natural bent for a manufacturing, an office, or a professional career. The sooner this adaptability is discovered, the better it will be for the boy and his parents.

An item we saw recently in a contemporary magazine, calls to mind that girls have vacations too and that a period of apprenticeship relieving the mother of some of her household tasks during the hot weather, will be a good thing all round.

THE SUMMER SLUMP

Who is to blame for the summer slump? This condition occurs as regularly as dog days and somebody must be to blame for it. The Lord sends rain and the Lord sends sunshine but he does not send orders for paper. Now-a-days, they have to be gone after. Summer time is growing time and the more things are cultivated the more they grow. We believe the same is true of business and we believe that business needs cultivation as much if not more in the summer than it does in the fall and winter. It may be harder to concentrate on labor when the golf links, the ball field, the woods and the water are so attractive, but we believe it pays to stick at it. Paper must be used during the summer and plans must be made for even greater use of it during the fall. The fellow who does his planning first is likely to do his subsequent work most efficiently.

We read not long ago of the discovery of a salesman that some customers are more affable on Saturday morning when the week's work has been pretty well cleaned up and there is the anticipation of a rest over the week end. Is it not possible that a somewhat similar attitude will be discovered during the summer and that the salesman can get a little closer to his prospect when there is not quite so much of a rush and when there are so many topics of common interest that will make an interview on business an opportunity to make a personal friend?

And even a small order looks good these days.

THE FLOWER GARDEN

A Bouquet from Max Cline

Mr. Max Cline, chief chemist of the International Paper Company is very much pleased with the textbooks on the manufacture of Pulp and Paper. He says:

> As I examine the volumes I am impressed with the care and attention which you must have given the work to produce the excellent coordination of the sections; the smooth flow of instruction from the practical primary subjects through the involved technical procedures of ground wood and wood cellulose production. It makes one anxious to read the remaining volumes of the text book.

COBWEBS

Mr. and Mrs. Joseph A. Bothwell announce the engagement of their daughter, Eleanor, to Mr. E. Douglas Hyndman, second son of the late Dr. G. E. and Mrs. Hyndman, of Sherbrooke. The marriage will take place June 10.

Mr. Hyndman is a graduate of McGill University in Chemical Engineering and member of the Technical Section. He was one of the boys who got his M. C. from the Prince of Wales when he visited Montreal. Here's to the happy couple.

We experienced a feeling of pride in our Canadian paper mills by the enthusiasm and compliments of Mr. John Paramor, managing director of the Watford Engineering Works, near London, regarding the pulp and paper towns in Canada which he had visited. After having seen several of these well kept, happy, and industrious communities he remarked that England has nothing better or more attractive than the surroundings in which our pulp and paper men live and work.

Our office has a new and much appreciated ornament as well as a very pointed reminder in the form of a framed picture of a bit of meadow and woodland on which is printed Joyce Kilmer's beautiful poem entitled "A Tree." Mr. Frank J. D. Barnjum who sent us this reminder of the need for conserving our trees has added the lines

"Help us Please to Save our Trees."

We trust that those who receive this picture and message will exert themselves to spread the gospel of conservation.

Cupid has been busy in East Angus.

A Dictionary of Pulp and Paper Mill Terms

FOREWORD

In order to assist the work of the Joint International Committee on Education, the Pulp and Paper Magazine and the Paper Trade Journal, the official organs respectively of the Canadian Technical Section and the U. S. Technical Association, are publishing the Dictionary of Paper Mill Terms prepared for the Industry's Textbook. The first instalment appears in this issue. Readers are requested to advise the editor of any errors, omissions, ambiguity or superfluity that may be noticed. Corrections will be made as the publication progresses. — *Editor.*

PREFACE

Industrial development is always associated with lengthening vocabularies and extending definitions. That position has been reached by the paper industry, which is rich with words and phrases of special application redolent of days before the art become an industry.

The compilers of this glossary wish to help the student, young employee, and layman in any work which requires a knowledge of the values of words devised to particular uses in pulp and paper mills, and to preserve, so far as possible, the interesting historical sentiment attached to the earlier words.

It is proposed, after simultaneous publication in "The Pulp and Paper Magazine of Canada" and "Paper Trade Journal" and the receipt of constructive — or other — criticisms and additions, to incorporate the work in Volume 5 of the series of text-books prepared by the Joint Executive on Vocational Education. Early comments will therefore be welcomed.

Acknowledgment is hereby given to friends who have suggested words, and to:

"The Condensed Chemical Dictionary" (Chemical Catalogue Company).

"A Technological and Scientific Dictionary" (Goodchild and Tweney).

The glossaries given in Sindall's "Elementary Manual of Paper Technology."

Dawe, "Paper and Its Uses."

Kress, Wells and Edwards, "American Pulpwoods."

Bromley, "Paper and Its Constituents."

A

Aberration
(1) Chromatic: The formation of a margin of several colors, owing to the splitting up of light rays on curved surfaces.
(2) Spherical: The effect produced by reflecting light rays from a circular surface. These reflected rays are at different points in any plane of vision.

"A" Frame. A triangular frame with a cross-bar, for supporting machinery, etc.

Abies. A group of coniferous trees, including spruce, larch, fir, etc.

Abietic Acid. The chief constituent of rosin ($C_{44}H_{64}O_5$). Its neutralization results in the formation of rosin soap for size. Occurs as anhydride $C_{44}H_{62}O_4$.

Abrasive. Any substance used for polishing or grinding surfaces, as emery or sand.

Absolute Pressure. Pressure referred to a vacuum. Atmospheric pressure is actually 14.7 pounds per square inch, absolute—usually given as 15 pounds.

Absolute Temperature. Gases lose 1/273 of their volume per degree centigrade in cooling from the freezing-point of water. Absolute zero is 273 degrees below zero centigrade of freezing-point of water. Temperatures so referred are called "absolute." One degree C. above the freezing-point of water would therefore be 274 degrees C. absolute. On the Fahrenheit scale absolute zero is —459° F.

Absorbency. The amount of liquid that a unit weight of paper will take up. Usually measured by the height to which water will rise in a strip of filter or blotting paper, in a unit time, and in water-resistant papers by immersion and determination of increased weight due to water retained.

Absorbent Papers. Paper made of suitable stock which is beaten a short time with sharp tackle and with roll down hard. It is run on the machine with minimum pressure and rapid drying. Soft cotton rags are best for this. Examples are blotting and filter papers.

Acceleration. Increase of speed; in physics, the rate at which velocity changes. The acceleration of falling bodies due to gravity is expressed by the factor g. or G., about 32 feet per second.

Account-Book Papers. Strong, even, well-made papers, hard tub sized, with good writing surface, usually azure laid. The finish of both sides of the paper should be as nearly equal as possible, and opacity is essential. (Bromley.)

Acetate of Lead. See **Lead Acetate.**

Acetic Acid. An acid compound having the formula CH_3 COOH, obtained by secondary fermentation of wine, cider or other fermented substances. It is the cause of the sour flavor of vinegar. Also obtained when wood is destructively destilled. Sometimes used to hasten the action in bleaching paper stock.

Acid
(1) Chemically a compound containing hydrogen which is liberated when the acid reacts with a metal.
(2) Having a sharp, pungent taste. See **Sour.**
(3) The opposite of alkaline.

Acid Dyes. Colors whose nature is such that they can only dye fibers satisfactorily in an alkaline medium.

Acid Plant. That part of a sulphite mill wherein the sulphur is burned and the acid liquor prepared and stored; includes limestone towers, or other absorption apparatus.

Acid Proof. Having the property of resisting the action of acids, or acid fumes, such as the lining, lead and bronze fittings of sulphite digesters and acid plants.

Adansonia. The inner bark of the baobab or monkey bread tree, found on the west coast of Africa. The best fiber contains a high proportion of cellulose.

Adhesive. Substances which cause two or more surfaces to stick together on drying, as glue, silicate of soda. Paper having one side coated with gum or mucilage.

Adipo Cellulose. A term applied to the complex cellulose substance which forms the cuticular tissue of cotton, straw, esparto and other fibrous plants.

Agalite. A filler similar to talc or finely ground asbestos, and having the same chemical composition; chiefly magnesium silicate.

Agave Americana. Agave aloe. A plant yielding fiber suitable for papermaking. Sisal cord or string is manufactured from a Mexican variety.

Agitator. A means of stirring fluids, usually consisting of a central revolving shaft to which arms of various patterns are attached with the object of keeping the mass in motion.

Air Dry. Containing an amount of moisture not further reduced by exposure to the air at ordinary temperatures (about 60° F.). In the case of wood pulp it is agreed to be air dry when the pulp is 90 per cent. fiber and 10 per cent. water. See **Moisture Test.**

Air-Dried Browns. Brown papers carefully made and slowly dried by exposure to air, which ensures great strength and elasticity.

Air Pump. See **Suction Pump.**

Albumen, or Albumin. One of the chief constituents of animal matter. Egg and blood albumen may be used in place of casein for coated papers, but coagulate at a lower temperature and do not form so waterproof a coating on treatment with formaldehyde.

Albumenized. Papers used in photography. Coated with albumen from the white of egg mixed with ammonium chloride, and then treated with silver salts sensitive to light.

Alder. A tree found in the Western United States and British Columbia. The red alder (Alnus Oregona) has been successfully cooked by the soda process. The pulp is similar in properties and fiber length to that from poplar.

Alea. See **Esparto.**

Algae. Tiny organisms growing in water, which give trouble owing to their growth in the water circulation systems of mills, plugging small pipes and causing slime. One form causing this trouble in iron pipes is known as **orenothrix.**

Alkali. Soda potash or ammonia; oxides, carbonates and hydroxides of sodium, potassium and ammonium.

Alkali-Cellulose. The compound obtained by treating cotton or wood cellulose with concentrated sodium hydroxide. Used in manufacture of viscose.

Alkali Waste. A residue of impure calcium sulphide produced in the manufacture of sodium carbonate

Alloys. Mixtures of metals, made while molten, such as babbits or bronzes.

Aloe. See **Agave.**

Alternating Current. Intermittent current of electricity flowing alternately in opposite directions. The period of change is called a cycle.

Alum. Papermakers' alum is sulphate of alumina, $Al_2(SO_4)_3 18H_2O$. Other alums are double salts, such as sodium alum, $Al_2(SO_4)_3Na_2SO_4 24H_2O$. Used as a mordant for dyes and to set size on to fibers. See **Mordant** and **Size.**

Alum Cake. A commercial form of aluminium sulphate.

Alumina. The oxide of aluminium prepared by strongly igniting aluminium (or aluminum) hydrate in a crucible. A white amorphous powder.

Aluminate of Soda. Prepared by dissolving freshly precipitated hydrate of alumina in caustic soda. Can be used in the process of rosin sizing.

Alumine. A trade name for a filler, consisting chiefly of calcium sulphate with a small proportion of aluminium sulphate. Said to be well retained by paper.

Aluminium Hydrate. A bulky gelatinous precipitate produced when ammonia is added to a soluble aluminium salt. If ammonia is added to the solution obtained by extracting paper with hot water, the formation of a gelatinous precipitate indicates the presence of alum salts.

Aluminium Resinate. A compound held by some authorities to be formed when rosin soap is treated with alum in sizing paper. Evidence of its formation is not conclusive.

Aluminium Sulphate. Used in the sizing of paper. Added to animal size it acts as a preservative. Added to rosin size it precipitates the rosin upon the fibers in the beating engine. An important mordant for fixing colors. See **Alum.**

Amalgam. An alloy in which mercury is one of the constituents.

Ammonia. A solution in water of the colorless gas NH_3—properly, "ammonia water." Also called "spirits of hartshorn." Used as a solvent for casein in coating for paper and in various ways as an anti-acid.

Ammonium-Chloride. A white powder or crystalline solid obtained by reaction between ammonia and hydrochloric acid; used in electric dry batteries and as a soldering flux.

Ammunition. Hard, strong papers made of wood pulp, hemp, or gunny; used for shot-gun shells and other purposes relating to ammunition.

Amorphous. Having no crystalline structure.

Ampere. The unit of electric current; the current produced by an electromotive force of one volt against a resistance of one ohm. It amounts to a transfer of one coulomb per second.

Amplitude. Extreme distance of swing, vibration or oscillation, as of a pendulum.

Amyloid

A substance obtained by the action of 30 parts of sulphuric acid upon cotton or cellulose. The syrup produced is poured into water and the resultant precipitate dried. The horny mass obtained is amyloid.

The change produced when paper is passed through sulphuric acid for the manufacture of vegetable parchment is the formation of this amyloid on the surface of the paper.

Angle Papers. Envelope papers, made in the usual way and after slitting cut at an angle, in order to economize in cutting the envelope blanks. Should have little difference in strength between machine and cross direction. contain little filler and sometimes a little soap as a top size.

Anhydride. An oxide which by the addition of H_2O to its molecule produces an acid as sulphuric anhydride, SO_3, which upon combining with water forms sulphuric acid, $SO_3 + H_2O = H_2SO_4$.

Anhydrous. Without water; dry.

Aniline. A coal-tar compound formed by replacing one hydrogen atom of benzene (C_6H_6) by the amino group NH_2—Formula $C_6H_5NH_2$; also called aminobenzene or phenylamine. Its formation is one of the first stages in manufacture of a number of dyes; hence all coal-tar dyes are often referred to as aniline dyes.

Aniline Sulphate. A compound which dissolved in water is used for detecting mechanical wood and esparto in pulps, giving a strong yellow color to lignified fibers.

Animal Size. Glue or gelatine. See **Size.**

Animal Sized Paper. A term applied to any paper which has been sized with gelatine or glue.

Annaline. Trade name for calcium sulphate, used as a loading material.

Annato. A fugitive coloring matter obtained from fruit of the annatto tree, giving shades or orange.

Anode. The conductor or electrode by by which an electric current enters the cell.

Anti-Acid Manila. A hard, strong paper made of hemp, or sometimes wood pulp, used for insulating purposes, as telephone wires, etc., and guaranteed free from an acid reaction.

Antichlor. A substance to offset or eliminate an excess of hypochlorite of lime or bleaching-powder. Sodium thiosulphate or any sulphite would act thus.

Anti-Froth Oils. Various compounds used to break up the foam, as in coating mixtures. There is no general specific, as froth is due to a wide range of causes.

Antimony. A gray metallic element which, alloyed with lead, increases its hardness and prevents collapse when antimonial lead is used for pipes in gas coolers of a sulphite mill.

Antiquarian. See **Sizes of Paper.**

Antique. A light, bulky paper having a soft, velvety feel, used largely for novels and standard works of fiction. In Europe sometimes made of esparto only or mixed with chemical wood pulp; in America various mixtures of sulphite and soda are used. Uncalendered and as a rule containing no loading.

Apron

A rubber-covered sheet carrying the carrying fluids or moving masses over gaps.

A rubber-covered sheet carrying the stuff or paper stock on to the wire of a Fourdrinier paper machine from the flow box.

Apron Board. A hinged board attached to flow box of a paper machine to support apron.

Aqua Fortis. See **Nitric Acid.**

Aqua Regia. A mixture of nitric and hydrochloric acids—so named because it dissolves the noble metals, gold and platinum.

Armature

(1) A piece of soft iron laid across

the poles of a magnet.

(2) That portion of a motor which by the motion of itself or another portion called the field cuts the lines of magnetic force, producing alternately positive and negative currents.

Arsenious Acid. See **Sodium Arsenate.**

Artificial Parchment. See **Parchment.**

Art. A paper, in Europe usually made of esparto and wood pulp; in America of a combination of sulphite and soda pulp. Coated on both sides with a mixture of glue and some mineral, such as china clay, and highly glazed. Used for the printing of half-tone blocks.

Asbestine. Ground short-fibered asbestos, used as a paper filler.

Asbestos. The mineral amphibole, frequently of a fibrous, silky nature, and used for fire prevention and heat conservation. Composition chiefly magnesium silicate.

Asbestos Paper. A paper composed largely of fibrous asbestos, used for theater curtains, screens, heat insulation, etc.

Ash. The mineral content of organic substances; the residue left after burning off combustible and volatile matter.

Ashcroft Tester. See **Bursting Strength.**

Asiatic Acid. Sometimes used for acetic acid.

Aspen. A tree (Populus tremuloides) of the poplar family, used for making wood pulp, usually by the soda process. Common in northern United States and Canda. Allied to cottonwood, which see.

Atlas. See **Sizes of Paper.**

Atmosphere. The gaseous envelope of the earth; a mixture of oxygen and nitrogen (approximately 21 per cent oxygen and 79 per cent nitrogen), with small quantities of carbon dioxide and rare gases.

Atmospheric Pressure. The pressure exerted on the earth by its envelope of air. At sea-level this 14.7 pounds per square inch.

Auramine. A yellow coal-tar dyestuff, basic in character, used in coloring paper, wool, silk and leather.

Autogenous Weld. The form of weld used in lead burning, the metals being placed in contact and melted by the oxyhydrogen blowpipe. Now much used with oxyacetylene blowpipe for all kinds of metal repairs. Applies also to the use of the electric arc in welding.

Available Chlorine. The chlorine in bleaching powder which effects the bleaching of cellulose, present normally in bleaching powder to the extent of 36 per cent.

Azure Laid. A term of long custom applied to certain high-class writings of a particular shade of blue, made on a "laid" mold or with a "laid" dandy. See **Laid.**

Azure Wove. A term applied to certain high-class writings of a particular shade of blue, made on a "wove" mold or with a "wove" dandy. See **Wove.**

B

Babbit. A bearing metal named for its originator; composed at first of copper 3.7 per cent.,antimony 7.4 per cent., tin 88.9 per cent. Bearings lined with such an alloy are said to be babbitted.

Back. The driving side of a paper machine.

Backfall. A dam of special design behind the roll in a beater. Its function is to assist the circulation of the stock.

Backing Papers. Brown papers which paste down easily and serve to strengthen the flong or mould of alternate paper and paste used for stereotype work.

Back Tender. Member of the machine crew next under the machine tender. A "second hand." Has charge of paper from presses to winders, passing sheet over dryers, is responsible for the drying and finishing operation, and seeing that other subordinates are properly stationed when starting up or when handling breaks.

Backwater. The water extracted from the paper stock on the machine by the wire, suction equipment and presses and returned to the system in order to save the clay. Coloring materials, alum, size or fibers contained therein or suction.

Bag. See **Bag Mill, Bag Paper.**

Bagasse. Refuse of sugar cane after extracting sugar; possible source of fiber for paper, and so used to a slight extent.

Bag Mill. A factory where paper bags are made.

Bag Paper. Paper of which bags are made. The usual qualities necessary are strength and toughness. Sulphate and carefully prepared sulphite pulps make good bag stock.

Balata. Gum of Mimusops Gloosa, native of Guiana and used in the rubber trade; hence, Balata belts, made from cotton-web impregnated with balata in place of rubber.

Bale. A bundle of pulp in sheets or other merchandise pressed and tied, or bound, while under pressure, in the baling press.

Balsam. A coniferous tree of the fir family (Abies Balsamea) used somewhat as a source of woodpulp, notable for the resinous syrup in its outer bark, known as Canada Balsam. If bark is not completely removed, this resinous matter may get into paper made from balsam wood-pulp. The fibers are shorter and softer than those of Spruce.

Bamboo. Any member of the genus **Bambusa.** A giant grass, often reaching a height of 40 feet, found in the tropical regions of the Eastern Hemisphere. Makes good pulp by sulphite or soda process; has no bark to remove; yields annual crop. Fibers not so long as, and narrower than in spruce, and similar to manila. There are many species, not all of them suitable for pulping.

Bank. A term applied to high-class machine writings, which are very strong and thin. Made from rags or wood-pulp, usually beaten from eight to nine hours. Paper is similar to **loan,** but not quite so heavy or transparent. Thin tough, glazed or unglazed banks run from hand-made, tub-sized, air-dried to machine-made, engine-sized, machine-finished. The usual sizes and weights are: foolscap, 7 lbs., large post, 11 lbs., medium, 13 lbs. See **Sizes** and **Ream Weight.**

Bank-Note Papers. Papers for which new linen cuttings are used. In Europe hand made, in North America mostly machine made. The notes having to withstand considerable handling, the paper is specially strong and tough.

Baobab. See **Adansonia.**

Barite. See **Barytes.**

Barium Sulphate. The chemical term for blanc fixe, produced by a reaction between sodium sulphate and barium chloride. Sometimes called "Basafor" in the trade, from its formula $BaSO_4$ Also called Heavy Spar. Its specific gravity is 4.1. Sometimes used as a filler for paper. Part of the mixture used in coating papers is Barium Sulphate.

Barytes. Barium sulphate as mined in nature.

Barker. A machine for removing bark from pulpwood. There are two general forms; the rotating cylinder, removing bark by rubbing and tumbling of the blocks in the interior, and the revolving vertical disk containing knives usually in its face by which the bark is shaved off.

Basic Colors. Dyes chiefly made from aniline, requiring the use of an acid mordant for dyeing paper fibers.

Basswood. A North America tree, Tilia Americana, with light, soft wood, sometimes used for pulp by the soda process.

Bast. Inner bark of plants; flax, hemp and jute are bast fibers.

Bastose. The cellulosic portion of the jute fiber.

Bauxite. A natural mineral, the hydrated oxide of alumina, from which alum is made by treatment with sulphuric acid.

Beater. A machine consisting of a tank or "tub" usually with a partition or "midfeather" and containing a heavy roll, revolving against a bedplate. Both roll and bedplate may contain horizontal bars of metal or stone (called fly bars) set on edge. The materials used in paper are circulated in the body of the beater and pass between the roll and bedplate. Formerly referred to as "beating engine" or "engine." See **Hollander, Umpherston, Taylor.**

Beater Roll. The heavy roll which gives the stock the necessary mechanical treatment and which also causes circulation in the beater, and contains horizontal bars on its periphery at close intervals. The roll can be raised or lowered in relation to the bedplate, and, in addition to causing circulation, mixes the fiber contituents together with the chemicals and fillers and is the agent for the variation in fiber condition and to a great extent, the character of the paper made.

Beater Tub. The tank or body of the beater, of various sizes and designs, usually oval in plan, and divided by a partition, or "midfeather"; in it the constituents of paper are mixed and prepared for the machine.

Beating. The process carried out in the beater whereby the various ingredients of paper are mixed and receive mechanical treatment, where less mechanical treatment is required, a mixing tank is used instead, as in newsprint and the reaction of size and alum facilitated. The coloring of paper is usually done while in the beater, and much of the ultimate character of the paper is there determined.

Bedplate
(1) A removable plate of stone or containing steel or bronze bars, placed across the direction of flow in beaters and underneath the roll.
(2) The stationary plate in the spout of a chipper, in conjunction with which the chipper knives act in producing chips.

Beech. A broad-leaved tree (Fagus atropunicea) with hard wood, found in North Eastern United States. Not used in any quantity for papermaking.

Bell. A defect in paper caused by bubbles of froth passing the slices and breaking before the suction boxes.

Benzo-Purpurine. An aniline dye similar to Congo red, yielding a bright red color unaffected by dilute mineral acids. A useful stain for microscopic work.

Berlin Blue. Ferric Ferrocyanide. See **Prussian Blue.**

Bible Paper. A thin strong paper, used for Bibles originally, in which opacity is a chief characteristic, obtained by carefully boiling and beating cotton rags. Wood pulp is now used in the cheaper qualities.

Bill Papers. Hand or machine-made, all-rag papers, tub sized, air-dried. Being used for documents, such as promissory notes, bills of exchange, etc., the paper must be very durable.

Birch. A tree of the deciduous or broad-leaved type. White Birch (Betula Alba.) is sometimes used for mechanical pulp in the Northern United States and Canada.

Biscuit. A term originally applied to papers used for packing biscuits, particularly thin sulphate papers glazed on one side. The paper is now used for wrapping all kinds of dry goods.

Biscuit Caps. Thin white M. G. papers, employed for making bags for confectionery and similar trades, in various sizes. (Bromley.)

Bisulphite of Lime. The compound of sulphur dioxide and lime present in the cooking liquor used by sulphite pulp mills, whereby in the digestion the lignin and non-fibrous materials of wood are rendered soluble.

Black Ash. Crude carbonate of sodium produced from the black liquor in the rotary burners in the recovery system of soda and sulphate pulp mills.

Black Liquor. Spent liquor resulting from cooking wood or other vegetable material by the soda or sulphate processes. It contains the dissolved lignin in combination with the inorganic chemicals used. See **Recovery.**

Blanc Fixe. See **Barium Sulphate.**

Bleach.
(1) The process of whitening pulp or cellulose, usually by removal of coloring matter, of lignin and other readily oxidizable impurities. The agent by which bleaching is done.
(2) Often refers specifically to Bleaching Powder (Chloride of Lime), Calcium chlorohypochlorite, or its solution. Sodium sulphite used in bleaching mechanical pulp.

Bleaching Powder. Calcium chlorohypochlorite, a compound in powder form produced by passing chlorine gas over slaked lime. Used for bleaching cellulose from rags or wood. Standard bleaching powder contains 35-36 per cent. of available chlorine.

Block Pile. The reserve of wood blocks cut to proper length for use in wood pulp mills.

Blotting. The trade term for blotting paper. A paper without sizing and of marked absorbent character. Best made from rags.

Blow. The dumping or discharging of a boiler or digester under pressure. When digestion of the charge of wood chips is completed, the contents of the digester are called a "blow".

Blow off. The gas or liquor emitted in discharging the digester.

Blow Pit. The vat or tank of wood or concrete into which the contents of a boiler or digester are discharged. Equipped with a "vomit stack" or pipe to permit the escape of the steam, and usually provided with a perforated false bottom. In it the pulp is drained of its spent liquor and washed. See **Vomit Stack.**

Blow Valve. The valve controlling the discharge of a digester. Blow off valve.

Blueprint
(1) A paper sensitive to light, used by engineers for copying tracings of plans, machinery, etc. Prepared by floating white paper on a solution of yellow prussiate of potash (potassium ferrocyanide) and peroxide of iron. Paper should have no filler and preferably of rag stock tub-sized with gelatine. Must stand the handling in water, essential to the development of exposed prints.
(2) The plans or designs shown on such paper.

Bluestone, Blue Vitriol. See **Copper Sulphate.**

Boards. Sheets of stiff paper, usually of a definite required thickness, sometimes consisting of several layers of paper made on board machines (which see.)

Board Machine. A machine with several cylinder moulds instead of a fourdrinier wire. It may have from two to seven or more moulds, vats, and couch rolls, depending on the thickness required or the number of layers desired in the finished sheet.

Bochmoria. See **China Grass.**

Boil. See **Boiling.**

Boiling. The act of changing liquids to a gaseous state; also the treatment of size, rags, or old paper by steaming or heating in water with lime or soda at the boiling temperature, or under pressure, in a closed vessel; Also refers to the preparation of rosin size.

Bolt Wood. Wood for headings or staves of barrels, ash, elm, red oak. Pulp wood delivered in two or four-foot lengths.

Bond Papers. Similar in character to banks, but heavier in weight. The term is often applied to superior looking engine-sized writing of medium substance, but strength is essential in all papers included in this class (Bromley). A certain translucency and rattle are desirable, the former due to absence of filler and the latter imparted by alum in excess or silicate of soda or both. The stock is beaten longer than for ordinary writings, and with dull knives or much pressure. The effect is due to partial hydrolysis of the cellusosic material. See **Sulphite Bond, Rag Bond.**

Bone Dry. Containing no moisture. Absolutely dry, the condition of wood pulp or paper after drying in an oven at 105 degrees centigrade to constant weight. See **Air-dry.**

Book End. A term applied to the papers used for the finishing of the insides of the covers of books. Of all qualities and colors.

Boom
(1) Timbers or logs chained together at the ends to hold logs in place on a stream or lake; sometimes several timbers side by side bolted together and battened or planked over.
(2) The logs confined by the boom.
(3) Swinging arm of a derrick to raise and move loads inside its radius. Its foot is fixed at the base of the mast, and a rope or cable runs through a pulley at its head.

(To be continued.)

A Forest Survey From the Air

By ELLWOOD WILSON, Chief Forester, Laurentide Company, Limited.

As Foresters generally have shown much interest in the use of aircraft and aerial photography for making forest maps and estimates, reconnaissances and so forth, it is probable that a description of a survey as actually carried out may be of interest.

The area, about which information was wanted, was situated 102 miles in an air line from the air station and about 24 miles from the railroad, 16 over a wagon road, and the remainder by water. A site was selected for a base, and an air engineer, a cook, camp equipment and seventeen drums of gasoline were sent in by wagon and boat. Two tents were put up, one for sleeping quarters and the other for a mess tent. This was on the shore of a bay, and the site selected for an anchorage was sheltered from all winds, and the water was deep enough to bring the nose of the plane up on the sand without endangering the hull. The beach was sandy and flat, and by a little easy digging a small channel was formed into which the plane could be drawn so that the engineers could easily get at the rigging and engine, and also re-fuel. The crew consisted of Pilot Maxwell, Forester-Photographer Townsend, Mechanic I. Vachon, and Rigger Hyde. The machine used was a Curtis HS2.L flying boat, No. G-C.A.A.D.

Previous to beginning the work, the chief of party of another survey crew, which was engaged in a survey and estimate of a fifty square mile tract about 45 miles south of the above base, was taken for a flight over the territory on which he was to work. He flew twice over the area with a map on which he made notations of the general lay of the land, the type of timber, and so forth, and this information proved of the greatest value in carrying out his survey.

The plane was moored out in the open during the duration of the survey, and in spite of rain, snow, and hail, suffered no damage and was continually on the job. Trips were made on cloudy and rainy days, and photography was carried on in winds up to fifty miles an hour. The boats used have been in commission for four seasons, and will be used again this year, showing that there is a reasonable life for aircraft.

Reported Forest Fire

One interesting side line of this work was the discovery and reporting of forest fires. On September 1st, a fire was sighted 18 miles away from the plane at 7.30 p.m. and the plane landed at the nearest telephone station and reported it. It is practically certain that the ground patrol would not have discovered the fire at this time of day, and it would probably have assumed quite large proportions before beng discovered the next day. Another fire was reported on September 3rd, and on September 8th, a report having been received that a fire had occurred on a certain lake, the plane was sent to investigate, and reported that there was not, and had not been, any fire. On all flights reports were made of fires burning, and areas already burnt were sketched and sent in to headquarters. Sketches made from the air were afterwards checked on the ground, and found to be almost as accurate as to areas as the ground surveys.

The total time spent in photography was 12.8 hours, and the area mapped was 140 square miles. This shows a performance of 10.8 square miles per hour of useful photos. The work was done at, as nearly as possible, an altitude of 5,000 feet, which gave plenty of detail for the interpretative work. In making a mosaic it is necessary to have the pictures overlap on all sides, and this was found difficult in high winds, but in ordinary weather went well. The photographer directed the pilot on his course by hand signals, and there was perfect co-operation between the two. No reconnaissance flights were made strictly for that purpose, but in test flights a considerable amount of reconnaissance work, sketching, and oblique photography was carried on.

Maps Easily Read

There was already an accurate map of the water courses and lakes on the area, and when the photographs were finished, the areas in the various timber types were transferred to it and the areas plani-metered. The ease with which these could be read from the photos, and their boundaries ascertained, was remarkable. The types were divided as follows: coniferous, containing eighty per cent or over of conifers, spruce and balsam or jack pine, conifer-hardwood, containing 60 to 80 per cent of conifers, hardwood-conifer, containing 60 to 80 per cent of hardwoods, barren, heath or treeless swamp and second growth, where young timber was coming in after burns. It was seen on the pictures that there were very many places where blow-downs had occurred running from one to fifty acres or more. Most of these would not have been discovered by a strip survey with the strips located a quarter of a mile apart, but when their aggregate area was measured, it was found to be of importance. The percentage of the various types, as ascertained from the photographs, was as follows:

Conifer, 35.7 per cent; Conifer-hardwood, 56.1 per cent; Hardwood-conifer, 2.4 per cent; Barren, .4 per cent; Second growth, .7 per cent; Water, 4.7 per cent; Scattered blow-down, 2 per cent of timbered area.

By comparing the photos with those taken in sections where the amount of timber per acre had been carefully determined an approximate estimate of the timber was made, and sample plots for ground study were picked out as representing fair averages of the stand. These plots have now been studied on the ground and check up well. There was no difficulty in locating the areas, picked out on the photos for study, on the ground and counts of the number of trees in quarter acre plots on the photos, when checked on the ground came within two to four trees. The photos of these sample plots and full descriptions of the timber, number of trees, heights, diamters, condition, and so forth, have been mounted on cards and can be used for estimating other sections by comparison.

In the area under consideration, many balsam firs have been killed by the spruce bud-worm and other insects in the last five years. Most of the attacked trees are dead and down, and their loss has resulted in opening up the stand. This lessening of the density of stocking shows up well on the photos. Sample areas laid out on the photos and having the unstocked areas carefully plani-metered showed an average loss of stocked area of about 28 per cent.

The Question of Cost

I am, unfortunately, not permitted to give cost figures for this work, for business reasons, but I can state positively, that if the latest costs for estimating the sample plots mentioned above are taken, and added to the inclusive costs for the aeroplane work, salaries, fuel, insurance, depreciation, making of pictures, (all on a basis of all the winter cost included), the final cost will be twenty dollars per square mile less than that charged by a large firm of consulting foresters for a big tract of land much more favourably situated and easier of access, and thirty dollars less than figures of one of the large companies for work done in 1920.

ECONOMIC REVIEW OF SWEDISH INDUSTRY

Compiled by The Swedish Board of Trade
Edited by The Swedish Foreign Office

(The following extracts are taken from a bulletin sent to the Editor by the Royal Swedish Consul General in Montreal, Mr. M. Chisiholm.)

The period of international liquidation which started during the autumn of 1920 has now been in development for one year and a half. In Sweden the turn of the price level occurred in the summer of that year with a maximum for June of 366% of the pre-war level, thus inaugurating the big slump in prices which presently seems to be nearing its conclusion. Though several commodity prices during the last months have been hardening, a pronounced stabilization of the price level — which has been the case in the United States — has not yet materialized. The drop of the price index number from 170 to 166 during February reveals, however, rather unsettled market conditions just as will be the result of a more close study of important quotations.

Two periods will be readily discerned in the aspect of the depression up to this date. The last quarter of 1920 and the first half of 1921 show a constant reduction in the volume of industrial production while exports of Swedish staple products were running extremely low. Liquidation as pictured by the number of business failures, however, had not yet set in during this first phase. The second half of 1921 and the first months of this year are to the contrary characterized by slight but undeniable increase in the activity of the basic industries and a very marked expansion in the volume of foreign trade, and especially the wood, pulp and paper industries are concerned. But simultaneously the inevitable results of depreciated stocks and frozen credits could not be postponed and as yet business failures, reconstructions and heavy losses in all branches of industry are the call of the day.

Wood Pulp Industry

The development on the pulp market during 1921 is of a very similar aspect to the one in the wood-goods-trade. The following table may help to enlighten the status of production in the pulp industry (thousands of tons calculated dry weight):

	Production	Capacity	Prod. % of capac.	Inland consumption	Exports
Sulphite					
Bleached ..	31	—	—	13	16
Unbleached ..	433	—	—	105	301
Total	464	850	55	118	317
Sulphate					
Unbleached ..	113		—	—	98
Bleached ..	3	-	—	—	5
Total	116	260	45	28	103
Mechanical		—	—	—	60

As to exports the chart reveals the same tendency in the volume of pulp shipped as in the quantity of wood-goods exported.

The distribution of exports on different countries during the first eleven months of 1921 will appear from the following table:

%	Sulphite	Sulphate	Mechanical
England	47	17	25
United States ..	30	74	17
France	6	2	14
Other countries ..	17	7	44
Total	100	100	100

In the middle of March the chemical and wood pulp market is characterized by a large number of supplementary orders and firm prices for bleached sulphite, while easy bleaching qualities show somewhat weakening prices in spite of an increase in the volume of sales. The mechanical wood pulp market, which during January and February was rather dull, has lately shown a quite pronounced improvement and the steady growth of the number of orders seems to forecast a stiffening of prices.

The German competition is presently of no importance as sulphite factories in Germany are sold a couple of months ahead. Finland, however, still competes actively with Swedish exporters.

Paper Industry

The normal number of employees in the paper mills is about 10,000. In the beginning of 1921 still 75% of the workers were employed in the trade but by July the rate had gone down to 60%. On account of a revival in the demand for wrapping paper, news rolls and cardboard the figure was 65% at the turn of the year. The output of letter paper and other similar qualities has decreased to 15% of normal.

THE NEW TARIFF AND THE PAPER INDUSTRY

The new Canadian Tariff will affect the Paper Industry very little, there being only two changes of any importance. Both consist of minor increases in the British Preference and apply to "Book Paper, coated and not coated, as used for the printing of magazines, newspapers and periodicals."

For Book Paper, machine finished, not coated, the new tariff imposes duties of 12½ p.c., 22½ p.c., and 25 p.c., for British Preferential, Intermediate and General respectively, compared with rates of 15 p.c., 22½ p.c., and 25 p.c., under the old tariff. Thus the British Preference has been *increased 2½ p.c. on this item,* the other duties remaining unchanged.

Imports from Great Britain under this classification, for the fiscal years 1920 and 1921 and for 1922 up to the end of February were as follows:

		lbs.	Value
	1920	48,270	$15,000
	1921	366,504	75,770
(11 mos.)	1922	136,355	29,169

"Book Paper, coated " comes into the new tariff at duties of 17½ p.c., 32½ p.c., and 35 p.c., compared with the previous rates of 22½ p.c., 32½ p.c., and 35 p.c., thus giving *a further preference of* 5 *p.c., to British made paper.*

For the fiscal years 1920 and 1921 and for 1922 up to the end of February, imports from Great Britain under this classification were as follows:

		lbs.	Value
	1920	1,097	$ 568
	1921	27,862	8,831
(11 mos.)	1921	5,113	838

Whether the reductions are large enough to affect British Exports to this country, as compared with American shipments, remains to be seen, but unless imports from Britain increase considerably, the Government will lose very little revenue from this source.

The duty on "Paper Caps for Milk Bottles" is reduced 7½ p.c. under each heading and on "Paper refills for sputum cups" the tariff remains unchanged.

Brains can make money, but money never made brains.
Don Valley Paper Mills has just had a bad fire.

BRITISH TRADE NEWS

(From Our London Correspondent)
London, May 15, 1922.

The two well-known firms of Spicers, hitherto trading as separate firms, have now been merged into one and their head office is Blackfriars House, London. As papermakers and paper sellers, the two firms enjoyed a high reputation in London and the Provinces. By merging they become a strong combination, financially and otherwise.

The Wages and Hours Question

Since my last news on the wages and hours conferences in London and Manchester, the Employers' Federation of Papermakers and the representatives of some of the Unions have met. It will be recalled that the workers were to take a ballot on terms submitted by the mill owners. This ballot will reject them. At all events the recent confering expressed on the terms it is greatly to be feared the ballot will refect them. At all events, the recent conference was private and from what I can hear the outlook is rosy. Unless something unforeseen happens there will not be a rupture in the paper industry. Only a few minor questions have to be settled and the hot-heads amongst the Unions will be easily dealt with in subsequent negotiations.

Associated Paper Mills, Ltd.

The report of the Associated Paper Mills, Ltd., for a period covering July 1920 to August 1921, has been circulated. It will be recalled that this combination was incorporated in July 1920, and it is one of the new syndicates. The company has completed the acquisition of the share capital of Edward Collins and Sons, Glasgow, and the assets and undertaking of Henry and Leigh Slater, of Manchester and Bollington, including the firms holding in the *Société Franco-Anglaise de Papiers Spéciaux,* near Paris. The profit for the period was £16.517, before reserving for excess profits duty and other taxation. Interim dividends were paid on the preference shares amounting to £26.273, thus leaving a balance on the profit and loss account of £9.756.

Paper Hats For A Dollar

Paper clothes used to be the rage in London—like the German paper sandbags in the Great War. Now the ladies of London — like their Chinese sisters of yore — are looking to paper for their latest creations. The style is modern, good, and attractive—and the cost 1 dollar. Somebody writes in a London evening newspaper that the paper for the hats is made from Canadian pulp imported by a "well-known and popular Knight," and one of the paper trade journals makes the happy announcement that two women were seen wearing smark-looking paper hats in Kingsway. It is an ill wind that blows nobody good.

Papermakers Fortune

Mr. William Dixon, (brother to Mr. Joseph Dixon) who died in February last has left £60.718. He was one of the most highly respected papermakers in England and Scotland—and was a thorough gentleman in business dealings.

Wall Paper Manufacturers

The report of the Wall Paper Manufacturers for the year ending August 31 last showed a loss on trading of £878.610 and after payent of interim dividend on preference shares and taking in income-tax and contingencies reserve, a debit balance remained of £557,203. The company at the same time announced that they had a big claim in against the Government for a refund of excess profits duty. The Directors now announce that at the end of the present month they will pay the arrears of dividend on the 5 per cent. cumulative preference shares up to August 31, 1921, i.e. six months dividend at 5 per cent. per annum.

Lord Northcliffe's Row

Lord Northcliffe announces that he is withdrawing his name from the Newspaper Proprietors' Association, of which he was a member. He does not like men who have made millions in other industries coming into London and telling the newspaper owners how they should do business with, amongst other things, their workers. Lord Northcliffe says the Association was excellent during the time paper was under a Government Controller, but times have changed since then. The attack, he makes on the Association is, so far as the newspapers are concerned, being treated with contempt.

Mr. Hall Caine

Mr. Hall Caine since his arrival in England has given interviews on his Canadian experiences and predicts higherprices in June for Dominion papers. He speakes well of Canadian progress and enterprise.

Mr. Hall Caine now goes on a European tour visiting Scandinavia, Finland, and other places.

Pulp Demand

Sellers of pulp report that there is a better feeling in the market and a fair amount of business is passing. Prices, however, are not in accordance with their wishes, but it is quite certain if they reach a higher level the present market conditions and demand will again become dull. Buyers maintain that they want encouragement and that they are sick and tired of the past hand to mouth dealing. They are now, enquiring about sulphite, strong and easy bleaching, and if any easemenent is shown in prices business is done. Groundwood still continues at low prices. Sellers report that recently they parted with some good orders.

Quotations are as follows in London:—Bleached sulphite £20; Easy Bleaching, £12.105.; Strong sulphite, £11—12.10s.; Unbleached soda £11; Soda Kraft, £11; Groundwood £4; dry £8.

Paper Demand

The conditions prevailing at present in the British paper industry show more liveliness. Newsprint is finding a good outlet at home and abroad and some good shipments are arriving from Newfoundland and Scandinavia.

The industry has received considerable assistance by the announcement of a reduction in income-tax and a revision in railroad charges. The reductions are not much, but they are something to be thankful for.

Preliminary Statistics

Preliminary figures show that the imports in April were about as follows:

	Pulp. Tons.	Paper. Cwts.
1922	43,257	708,822
1921	26,886	331,596
1920	71,527	876,626

The export trade of paper reached 138,000 cwts, which excels the trade of April 1921. There is no doubt the export trade has picked up wonderfully well during the past five months.

FUNNY BUT TRUE

Mark Twain in his early days was editor of a Missouri newspaper. A superstitious subsciber wrote him, saying that he had found a spider in his paper, and asked wether that was a sign of good or bad luck. The humorist wrote this answer and printed it:

"Old Suscriber: Finding a spider in your paper was neither good nor bad luck for you. The spider was merely looking over our paper to see which merchant is not advertising, so that he can go to that store, spin his web across the door, and live a life of undisturbed peace ever afterwards."

DECLINE IN PAPER AND PULP EXPORTS

Canada's exports of pulp and paper for April were valued at $6,490,359, a considerable decline from the previous month when the value was $10,672,332 and a decline of $455,877 from the mouth of April,1921.

Although much less in volume than for the month of March, exports of both paper and pulp showed striking gains in volume over April, 1921, particularly pulp exports, which amount to 621,533 cwts., compared with 301,628 cwts. in the previous year.

The decline in value occurred in pulpwood and manufactured paper, occasioned in the latter case by a decrease in price.

The figures for April 1922 and 1921 are as follows:

PAPER

	Apr. 1921 Value.	Apr. 1922. Value.
Book paper	$ 83,796	$ 560,000
Newsprint	5,241,893	4,371,961
Other paper	405,965	319,542
	$5,731,654	$4,692,063

PULP

Sulphate kraft	$424,430	$511,615
Sulphate, blchd.	254,345	654,903
Sulphate, unblchd	404,380	452,564
Mechanical	131,427	179,214
	$1,214,582	$1,798,296

The principal countries of destination of these exports were:

	Paper.	Pulp.	Total
U.S.	$4,031,226	$1,588,806	$5,620,032
U.K.	122,107		122,107
Others	538,730	209,490	748,220

Exports of pulpwood were smaller in April, being 49,076 cords valued at $476,344, compared with 96,998 cords valued at $955,983 in March and 73,017 cords valued at $977,537 in April, 1921.

DANISH PAPER AND PULP MARKET

Assistant U. S. Trade Commissioner O. S. Payne,
Copenhagen.

The Danish paper market is reported as being firm. The labor troubles in the Swedish paper industry have resulted in increased demand for Danish paper from France, England, and the British oversea colonies. Recently the price of Danish newsprint in the English market increased about £1 per ton. Because of the fact that the agreements with the workers in the paper industry expire on August 1, it is possible that there will be labor troubles in the later part of the summer. The wood-pulp market remains dull and unchanged.

PROVINCIAL SODA PULP MILL CLOSED

The Provincial Paper Mills of Toronto which has for some years operated a soda pulp plant in connection with the Barber mill, at Georgetown, Ont., closed it up. It was found that soda pulp, which was used as a filler in several lines of book paper, was too expensive to produce under existing circumstances and that equally as good substitutes could be provided at considerably less cost. The closing of the soda pulp plant did not come as a surprise as the company have been contemplating this step for some time.

PORT ARTHUR PARAGRAPHS

The Consolidated Water Power and Paper Company, of Wisconsin Rapids, Wis., are operating the Kaministiqua Pulp Mill, recently purchased by them at Sheriff's sale, at full capacity, and are turning out thirty tons of ground wood pulp every twenty-four hours. They are employing forty-five men, working in three shifts of eight hours each. The company is amply supplied with pulpwood by the Pigeon River Lumber Company, from their Dog Lake limits, ranging in price from $9 to $10, per cord, delivered at the mill.

The barker handles sixty cords daily, twenty-eight being consumed in the mill, and the balance placed in stock-pile on the mill grounds.

The output of the mill in ground wood pulp is being stored on the premises, awaiting cargo lots that will be shipped to the United States for consumption in the company's own paper mills, at Ashland, Wisconsin Rapids, and other points.

It is understood that it is the company's intention to considerably enlarge the present plant, during the current season, and, ultimately erect and operate a paper mill of large capacity on these premises. Mr. George Berke is expected to arrive in Port Arthur shortly to outline the plans for the proposed improvements.

Pulpwood shipments to Port Huron, Mich. Erie, Pa. and Manistique, Mich. began earlier this season than usual. Already upwards of 7000 cords have gone out to these points, and it is expected that the season's shipments will exceed that of any former year, while the local consumption of pulpwood will be far greater than any previous year.

The Nepigon Fibre and Paper Company's plant is at present closed down, for alternations and improvements. It is reported that this company is about to enter a merger of New York pulp and paper interests, of large capitalization, that is now operating extensive pulp and paper plants at points in the United States. The company's plant, equipment and property were recently appraised, with this object in view.

It is reported that the Great Lakes Pulp and Paper Company, over the site of which there has been so much controversy between the Ontario Government, and various municiaplities and the company, have finally decided to locate at Nepigon, and will be customers of the Hydro Electric Power Commission for the power necessary to their proposed operations.

SWEDEN SPEEDING UP

A speed-up policy in all business and industrial activities under its control has been adopted by the Swedish Government, which is headed by Premier Branding, Socialist leader.

In keeping with this policy, a special committee of experts, assigned to report on the best methods of exploiting the national forest reserves, now urges the Government to expand its forestry enterprises, erect paper pulp mills, establish saw mills on state forest domains and go into business on a more aggressive scale with increased efficiency and closer economy.

The committee proposes that the Government erect a paper pulp mill and take over three saw mills in northern Sweden and that the State Domains Board, having control of Governmental business enterprises, be authorized to build new saw mills in different parts of the country where the Government owns forest lands.

Last year the gross revenues of the Government domains amounted to 28,400,000 kroner (equivalent to about $7,385,000). The Government is anxious to increase these revenues.

PULP AND PAPER NEWS

Mr. J. A. Taylor, of the Brown Corporation, Quebec City, was among the Canadian representatives attending the Convention of the National Association of Purchasing Agents, held at Rochester, N.Y.

Mr. Kay Grabtree, superintendent of the Grabtree Mills, Howard Smith Paper Mills, Limited, has been elected Mayor of Grabtree Mills, P. Q.

Mr. Gorman, of the Montreal office of the Provincial Paper Mills, Limited, is recovering from his illness.

Mr. John Martin, of the John Martin Company, Limited, Winnipeg, has returned from his visit to Europe.

The staff of the Montreal office of the St. Maurice Paper Company, Limited—numbering 20—held a picnic on Victoria Day. They spent a very enjoyable time at Cap Madeleine, making the journey in the Company's boat Charlemagne. On arrival the party was met at the wharf by a number of the employees at the company's mills at Cap Madeleine and Three Rivers. The visitors inspected the pulp, paper and saw mills and were also shown round the City of Three Rivers. Luncheon was served in the paper mill, the program including dancing in the Company's bungalow. The Montreal staff returned in the evening by train. The picnic proved a great success, due to the co-operation of the office and other employees of the company at Cap Madeleine and Three Rivers.

Mr. S. J. B. Rolland, President of the Rolland Paper Co., has been appointed a direction of the Provincial Bank of Canada. He succeeds Mr. Martial Chevalier. Mr. Rolland was commissioner-censor.

The new Mount Royal Hotel in Montreal will be covered by a Barrett specification roof, laid by the Carmichael Waterproof Co., Toronto. The area is about 70,000 square feet.

Quarterly dividend of one and a quarter per cent. (1¼) per cent. has been declared on the Capital Stock of the St. Maurice Paper Company, Limited, payable on Friday the 16 th of June, to shareholders of record at the close of business the 6th of June, 1922.

Another flying boat for patrol has been purchased by *the Chicago Tribune,* owners of the Ontario Paper Co., to be used for inspection and survey purposes of their forests limits in Canada, and will be stationed in the vicinity of Baie des Chaleurs, Bonaventures Co. The flying boat left New York on Monday afternoon, making several stops, so that the actual flying time to Quebec was six and a half hours.

PROPOSED CONSTRUCTION OF CANADIAN PULP AND PAPER MILL

U. S. Consul Norton F. Brand, Fernie, British Columbia

For some weeks cruisers have been busy estimating the amount of pulp wood available along the Wigwam and Lodgepole Creeks, which are tributaries of the Elk River. It is understood that these operations are being conducted by the Government at the instance of Chicago newspaper interests, which have in view the establishment of a $2,000,000 pulp and paper mill on the Elk below Elko in British Columbia, provided reserves of pulp wood aggregating 500,000,000 feet can be guaranteed.

CANADIAN KRAFT FOR AUSTRALIAN TRADE

It is reported that there is an increasing demand for Canadian kraft paper from all large overseas markets and especially from Australia.

The Wayagamack Pulp and Paper Co., Ltd., the largest Canadian producers in that line, has developed a considerable trade with the Commonwealth. The steamer Opawa which sailed recently is carrying a large shipment of orders of Wayagamack paper to Australia. In fact, this is the largest single shipment which the company has made in years.

Exports of sulphate kraft pulp for April as compared with last year show an increase of nearly $100,000 in the figures. Altogether pulp exports for that month amount to $1,800,000 as compared with $1,200,000 in 1921. It is an indication that business is picking up in that line to a noticeable extent.

OPERATING THREE BOARD PLANTS

The three plants of the Canadian Paperboard Company, situated at Frankford, Campbellford and Montreal, are stated to be now operating twenty-four hours a day. The activity of the paperboard industry is a recognized trade barometer, and as such indicates a significant improvement in business conditions. Paperboard is used at the present time in almost every line of business.

FLOOD CONDITIONS IN THE NORTH

There were exceptional flood conditions on the rivers running to James Bay this spring and some pulpwood cutters lost considerable portions of their cut. This affected the Groundhog, Kapuskasing, Frederick House and Mattagami Rivers.

One of the most serious conditions was noted recently in these columns. This was o lot of pulpwood on the Kapuskasing River belonging to the Spruce Falls Co. About 80,000 cords was on the bank and in the river, and the waters came into flood a second time, the level being five feet higher than past records. One boom in the lower part of the jam broke and a large number of logs were carried down.

Mr. Albert Stewart of the Spruce Falls Co. in on the spot and is estimating conditions with a view to recovering as much wood as possible. A widening of the river a short distance down will make it possible to collect some logs and tow them back to the Company's railroad.

Rivers are now at normal levels, but it will be some weeks before the actual loss can be determined.

PULP LOGS STRANDED IN ST. FRANCIS RIVER

Sherebrooke, May 25.— The recent lowering of the water in the various rivers in the surrounding district has had the effect of stranding many pulp logs which were being floated to the mills in the annual spring drive. This is especially noticeable in the St. Francis River, where many have been caught on the river's bank or on suddenly-revealed islands.

This has occurred to a greater extent between Sherbrooke and Lennoxville than elsewhere, where the sand banks and shoals have kept many logs from reaching the boom, which is several miles below Sherbrooke.

Technical Section

REVIEW OF RECENT LITERATURE

A—Properties, Chemistry And Testing of Raw Materials And Finished Products

A-1 B-1 Deciduous Trees for Paper Making. Poplar. CH. GROUD. **Papier,** xxiv, 503-506, (Nov. 1921). A general description of various species of poplars. -A. P. -C.

A-1 B-1 Paper Making Woods: Birch. CH. GROUD. **Papier,** xxv, 11-13, (Jan. 1922). A general description of birch and of its distribution. -A. P. -C .

A-1 B-1 Spruces. CH. GROUD. **Monit. Papeterie Francaise,** lii, 751-752, (Dec. 1, 1921). Brief description of black, white, red, Engelmann, and Sitka spruces. -A. P. -C.

A-1 B-1 Firs. CH. GROUD. **Monit. Papeterie Francaise,** liii, 8-9, (Jan. 1, 1922). Brief description of various species of firs **(Abies.) -A. P. -C.**

A-1 F-0 Soda Pulp from Australian Hardwoods. R.A. FOWLER. **Australian Forestry J.,** July 15, 1921; **Paper,** xxix, No. 8, 24-25, (Oct. 26, 1921). Experiments were carried out with the following Australian hardwoods: Mountain ash, blackbutt, spotted gum, mountain gum, karri, and silky oak. The woods were pulped by the soda process and made into waterleaf papers which were then tested by means of a Schopper tensile strength machine and a Mullen tester, comparing them with stationery selected at random from office stock. The experimental sheets were stronger in almost every respect than the samples taken from stock, which contained little or no groundwood. -A. P. -C.

A-1 A-4 A-5 The Chemical Changes Involved During the Infection and Decay of Wood and Wood Pulp. MARK W. BRAY and JOSEPH A. STAIDL, Forest Products Laboratory, Madison, Wis. **J. Ind. Eng. Chem.,** xiv, 35-40, (Jan. 1922). (Compare Mahood and Cable, **Pulp and Paper,** xviii, 900, A-5, D-0, Aug. 26, 1920.) In all cases the infected woods produce less pulp (mechanical, sulphite, and soda) per unit weight of wood than the sound woods. The points of inferiority of the infected woods over the sound woods are: (1) Cold-and hot-water soluble materials increase during decay and are a direct loss to the mills. (2) High alkali-soluble materials are found, showing a lower resistance to the action of chemical agents. (3) Increase in copper number. (4) In most cases of extreme decay, the rate of degradation of lignin and cellulose is selective and not uniform. (5) Lower percentage of alpha-, or stable, cellulose, higher percentage of beta-, or less stable, cellulose. The large losses sustained in converting infected woods into pulp, together with the additional losses of further converting these pulps (made from infected woods which undergo further decomposition when stored) into paper, are pointed out. The paper made from decayed woods and pulp is dirty, brash, and has very little strength. It requires more sizing, offers difficulty by sticking to the couch and press rolls, and foams excessively. The yield of finished paper is greatly reduced, while the cost of production is increased, because the decayed chips occupy the same space in the digester and use therefore the same amount of chemical as the sound wood requires and in some cases more. Decayed wood also requires the same expenditure in grinding. -A. P. -C.

A-1 B-4 K-15 Utilization of Jack Pine in the Manufacture of Newsprint. MAURICE NEILSON, Belgian Industrial Co. **Pulp and Paper,** xx, 61-63, (Jan. 26, 1922); **Paper Ind.,** iii, 1510-1513, (Feb. 1922); **Paper,** xxx, No. 24, 7-10, (Feb. 15, 1922); **Paper Trade J.,** lxxiv, No. 7, 45-47, (Feb. 16, 1922). Experiments were carried out on a commercial scale on the utilization of Jack pine for the manufacture of news print sulphite. It was found that a fair yield of pulp could be obtained from Jack pine; but the screenings are somewhat higher than with spruce when steamed under the same conditions and for the same length of time, about 8 per cent. for spruce and 14 per cent for Jack pine. After some experimenting the steaming time was reduced from 11 hours to about 9 hours; but it is suggested that a better yield could be obtained with a relatively short cooking time by using chips considerably smaller than what at present is standard for spruce chips. With the seasoned wood used in the experiments, no pitch troubles were experienced on the paper machine. The number of breaks and time lost were actually less than during the other periods compared, while speeds compared favorably. Paper production did not suffer during the period of the experiments (12 days), and the bursting strength and moisture were well maintained. Green wood is apt to cause a considerable amount of pitch trouble, but in the author's opinion, the same is true of green spruce. Though no tests were run on the utilization of Jack pine for groundwood, as much as 35 per cent. Jack pine has been used in the groundwood mill on some occasions, and no pitch trouble was encountered as long as the stock was kept free and the stones were properly dressed to take care of this wood . -A. P.-C.

B-FORESTRY

B-2 Growth Measurement of Trees. A. H. BERKHOUT. **Schweiz. Zeitschr. Forstw.,** lxxi, 377-379, (1920); **Botan. Abs.,** viii, 144, (June 1921). A formula is worked out on the basis of relation of diameter to cubic contents. Ten trees are selected in each type. One group is in small, one in medium, and one in large trees. The average diameter and cubic contents are obtained by careful measurements, and the average tree is used for the stand to be studied. If desirable, the trees measured may be remeasured at any time and the annual or periodic increment may be obtained. It is recommended that the trees be climbed and measured. -A. P. -C.

B-2 The Measurement of Trees in Connection with their Growth. A. H. BERKHOUT. **Mededeel. Landbouwhoogeschool Wageningen,** xvii, 109-225, (1920); **Botan. Abs.,** viii, 144, (June 1921). It is desirable in measuring lumber for forest calculations that the laws of probability be more generally used. A great number of examples are given. -A. P. -C.

B-3 C-5 Disease in Forest Trees Caused by the Larger Fungi. E. CHEEL and J. B. CLEVELAND. Forest Commission of New South Wales, **Bull. 12,** (1918); **Botan. Abs.,** viii, 307, (July 1921). The authors emphasize the importance of the study of fungi causing decay of living trees, stored lumber, and building timbers, giving non-technical descriptions of various members of the genera **Armillaria, Pholiota, Pilyporus, Polystictus, Fomes Hexagona,** and **Trametes,** which have been found or may be found causing the decay of important woods. Plates are given illustrating the rots produced by, or the sporophores of, several forms of fungi. -A. P. -C.

B-5 Use of Caterpillar Tractors in Logging. G. HUFFEL. **Rev. Eaux et Forets.**, 1ix, 40-42, (1921); **Botan. Abs.**, ix, 24, (Aug. 1921). Experiments in the forest of Haguenau (Bas-Rhin) showed that a small 35 h. p. caterpillar tractor weighing 660 lbs. can easily climb slopes of 35 to 40 per cent. and cross swamps, ditches and small streams. Ie is not of interest in regions where logging is easy and not expensive, but can be used to advantage in removing logs in mountainous country without good roads or in other regions difficult of access or where team transportation is costly. Its usefulness in felling coniferous trees is limited to cases where it is desired to extract the stumps, as is usually the case, and then only when labor is particularly expensive. -A. P. -C.

B-5 Monorail for Logging. K. MOLDENHAWER. **Dansk Skovforenings Tidsskr.**, vi, 19-25, (1921); **Botan. Abs.**, ix, 29, (Aug. 1921). A description of a monorail for transporting logs from the woods, which consists of one ordinary rail laid on posts set in the ground; a wheel running on this rail carries a balanced carrier of logs on each side of the rail line. The advantages of this method of transportation are that it is cheaply constructed, does no require wide clearings or bridges, the grade is obtained by having posts longer or shorter according to the lay of the ground, and logs are readily carried over rough ground and across creeks, roads, and natural depressions. The speed of the loads can be controlled by a brake. -A. P. -C.

B-5 Use of Motor Trucks in Woods Operations. F. W. FENN. **Paper Trade J.**, 1xxiii, No. 19, 46, 48, (Nov. 10, 1921); **Paper**, xxix, No. 12, 22-24, (Nov. 23, 1921). A brief discussion of the advantages of developing the use of motor trucks for general purposes, and more particularly for woods operations, illustrated by the case of what has been done in this line by the Great Northern Paper Co. -A. P. -C.

B-5 Use of Tractors in Logging. N. C. BROWN, State College of Forestry, Syracuse, N.Y. **Paper**, xxix, No. 13, 16-17, (Nov. 30, 1921). A brief discussion of the merits of tractors for logging. -A. P. -C.

B-5 Tractors for Logging Operations. .**Paper**, xxix, structed, does not require wide clearings or bridges, the No. 13, 18-19, (Nov. 30, 1921). Figures are given (taken from actual operations), showing the saving that can be effected by the use of tractors instead of teams hauling pulp wood and timber. -A. P. C.

B-9 The Wood Resources of the Pacific Northwest. K. RATTINGER **Forstwiss. Centralbl.**, x1iii, 293-305, 360-374, (1920); **Botan. Abs.**, ix, 30, (Aug. 1921). The forest regions of Canada are described in some detail, and more particularly the Pacific Northwest. -A. P. -C.

E-Sulphite Manufacturing And Equipment

E-2 Cutting Oil from Sulphite Waste Waste Liquor. Fr. patent No. 516,392, F. GERLING, April 18, 1921. Papeterie, x1iii, 1072, (Dec. 10, 1921). Saponifying agents, and more particularly alkaline solutions, are added to the sulphite waste liquor or which can be either in a liquid, solid, or pulverized state. For example, 20 per cent of soda liquor, and 80 per cent. of sulphite waste liquor are heated to 60 to 70 degrees while agitating vigorously. A. P. C.

E-2 Using Sulphite Waste Liquor Residue for Fuel. G. HALLBERG. **Paper Mill**, x1iv, No. 52, 4, 34, (Dec. 24, 1921); **Paper Trade J.**, 1xxiii, No. 26, 45-47, (Dec. 29, 1921); **Paper Ind.**, iii, 1395 1398, (Jan. 1922). **Paper**, xxix, No. 19, 7 10, (Jan. 11, 1922). An account of experiments carried out at a Swedish mill on the concentration of sulphite waste liquor and its use as a fuel, showing the considerable advantages to be obtained. It is claimed that a sulphite mill having sufficient hydro-electric power to drive its machinery will be able to cover its fuel requirements for cooking, drying, heating, etc., without any other fuel except the bark from the wood room and the fuel from the evaporated waste liquor. -A. P. -C.

E-2 Recovery of By-Products from Wood Before Sulphite Cooking. Can. patent No. 214,081, C.F. BURGESS LABORATORIES, assignee of H. F. WEISS, Nov. 1, 1922. The chipped wood is leached with hot water (preferably on the counter-current principle) and the extract is treated for the recovery of the organic subtances dissolved out. The chips are then treated as usual for making into chemical pulp, the pulp making being facilitated and the consumption of chemicals reduced. The process is particularly suited to the treatment of Western larch, which contains 600 to 850 pounds of extract per ton of wood, and the main by-product in this case is galactan. -A. P. -C.

F-Soda And Sulphate Manufacturing And Equipment

F-4 Alkali Recovery in the Sulphate Process. CLINTON K. TEXTOR, Alberene Stone Co., New York. **Paper**, xxix, No. 20, 17-19, No. 22, 7-9, (Jan. 18, Feb. 1, 1922); **Paper Trade J.**, 1xxiv, No. 7, 50-52, (Feb. 16, 1922). A description of the recovery of alkali from the spent liquor of the sulphate process, based on personal experiences and observations in mills, which may be taken as typical of American practice. -A. P. -C.

F-4 F-5 The Bad Odor from Sulphate Pulp Mills. BROR N. SEGERFELT. **Pulp and Paper** xix, 1281-1282, (Dec. 22, 1921). The bad odor evolved during the cooking process is due to the action of the sodium sulphide in the liquor, and in the recovery process is due to evaporating and burning black liquor regained from the cooking process. It can almost be eliminated by cooling the gases sufficiently and diluting the condensate with a great amount of water. The bad odor is decreased by decreasing the amount of sodium sulphate added to the smelters, and is always serious when sodium bisulphate is used. It is almost eliminated in the recovery process by having a high temperature in the furnace and combustion chamber, and by exchanging the disc evaporator for boiler and economizer (Sundblad and Sandberg's method). It is entirely eliminated in Rinman's method which does use sodium sulphate. -A. P. -C.

F-5 Removal of Odors from Digester Blow in Sulphate Mills. GUSTAF F. ENDERLEIN, Nekoosa-Edwards Paper Co., Port Edwards, Wis. **Paper Trade J.**, 1xxiii, No. 21, 40, 42, (Nov. 24, 1921); **Paper**, xxix, No. 12, 9-10, (Nov. 23, 1921); **Pulp and Paper**, xix, 1233-1234, (Dec. 8, 1921); **Paper Ind.**, iii, 1287, 1289, (Dec. 1921). The most difficult part of the problem is the removal of the odors from the furnace gases on account of their dilution and large volume; the removal of the odor from the digester is more inside of the possible with apparatus that is easy and relatively cheap to construct. The article describes an apparatus for the latter purpose, consisting essentially of a barometric condenser made up by means of two stand pipes placed side by side, each of which has a set of sprays inside and dip into a common well. The relief gases from the saveall room are sent to this apparatus, and the hot water coming from the well has no smell. The action is one both of condensation and of oxidation of the evil smelling compounds by the oxygen of the air. -A. P. -C.

(Continued on page 462)

UNITED STATES NOTES

A wireless dispatch to the *New York News* from London last Thursday told of the launching in Londonderry of the steamer *New York News*, the first of a fleet being built in Great Britain for conveying timber from the shores of the Gulf of St. Lawrence to the *Chicago Tribune's* pulp and paper mills at Thorold, Ontario. The christening ceremony was performed by Miss Irene Rogers, daughter of H. H. Rogers, one of the directors of the company. The second of the *Tribune* fleet, the *Chicago Tribune*, will be launched in the yard of Swan Hunter Whigam Richardson Company at Walls End, near Newcastle at an early date.

The International Paper Company has leased the seventeenth and eighteenth floors of the Pershing Square Building, New York City, which is to be erected on the site of the old Grand Union Hotel, Forty-second street and Park Avenue. The lease is for a ten year term and, according to the brokers who handled the deal, it calls for a rental of about $1,000,000. Negotiations have been pending for over two years. The present offices of the company are at 30 Broad street. The floors just leased for the executive offices will be ready for occupancy about April, 1923.

The old Badger mill of the Kimberly-Clark Company of Wisconsin has been converted into a cellucotton plant because of the enormous growth of demand for "Kotex" a cellucotton product made by a subsidiary, the Cellucotton Products Company. This concern was organized shortly after the war and the manufacture of Kotex started on a small scale. A greatly increased demand has been worked up though national advertising.

A warehouse that promises to be a model of its kind and perhaps the finest in Michigan, is being erected by the Bermingham and Proesser Company in Kalamazoo, Mich. Work on the structure was begun last week by the Miller-Boyer Construction Company.

The Mine Safety Appliance Company of Pittsburg, Pa., announces that it has secured the services of Edward H. Kellogg as assistant sales manager. Mr. Kellogg is a brother of R. S. Kellogg, secretary of the News Print Service Bureau, New York. He has been connected with the paper laboratory of the Bureau of Standards in Washington since November 1921. He was in charge of an investigation looking to the utilization of American seed flax for paper making.

David Robinson and Max Rosenthal, both well known to the New York trade, have acquired control of the old Seely Mills at Scotch Plains, N. J. They have incorporated under the name of the Twin Falls Binder Board Mills with capital stock totalling $125,000. The plant, which has recently been operated as the Twin Falls Paper Mills and the Pulp and Fibre Products Company, Inc., will be expanded by the addition of new machinery. Some of the old machinery is being replaced by more modern equipment and boilers are being installed so as to develop five hundred more horse-power.

The International Paper Company has re-opened its No. 4 mill at Watertown, N. Y., which was closed a year ago. The mill has a capacity of thirty tons daily.

Home is the truest interpreter of life. What one is at home is what he will be in eternity. There character reveals itself, and the real man is as he seems.

J. J. PATRICOF MAKES CHANGE

Jacob J. Patricof has severed his connection with the American Woodpulp Corporation, of 347 Madison Avenue, New York, and has resigned as President of the J. J. Patricof Company, Inc., of the same address, and has disposed of his interests in the latter corporation to the American Woodpulp Corporation. Mr. Patricof is temporarily located at 135 Broadway, New York, Room 1101, telephone Rector 7967-7 and will in the course of the next several days make an announcement regarding his future plans.

AMERICAN NEWSPRINT OUTPUT MAINTAINED

New York, May 27.—Newsprint production in American mills, as reported to the Federal Trade Commission for April, amounted to 111,861 tons against 115,408 tons a year ago. Shipments last month amounted to 115,167 tons, against 122,091 tons a year ago. Stocks on hand at mills April 30 amounted to 24,874 tons, compared with 35,106 in April, 1921.

Four months' production to April 30 amounted to 432,962 tons against 449,810 tons the corresponding period of 1921, and shipments this year amounted to 432,022 tons compared with 439,467 in 1921.

I. P. CO. WILL NOT DEAL WITH UNION

Albany, N. Y., May 27. — Representatives of 8,500 striking paper makers in 31 mills of the International Paper Co. have offered to meet the company "halfway" in an effort to end the strike which was called more than a year ago. Following a three-day conference here of representatives of the strikers, a telegram was sent to President Dodge of the International Co., suggesting a conference to settle the controversy. Members of the Glens Falls and Fort Edward unions are said to be anxious to return to work.

The International Paper Co., through its president, Phillip T. Dodge, refused to meet the committee of the workers' union to negotiate a settlement of labor troubles in company's mills. In response to the telegram from the committee Pres. Dodge sent the following answer to Albany: "Replying to your telegram of May 20, delivered in my absence from town and received this morning, the existing rules of this company make ample provision for meetings with employees and adjustment of all questions arising both at local mills and with the general management. These rules fix the permanent policy of this company, and will be rigidly observed until changed by agreement between the company and its employees. Employees are only those who are on the payrolls from time to time. No man signing your telegram is on our payrolls or in the service of the company. Your committee apparently represents only former employees still on strike.

"Manager Curtis' letter of July 1, 1921, specifies the company's position relating to employment of former employees. Re-employment can be secured only by individual application to local managers where there are vacancies. We trust your committee understands this company is now producing all the paper that market conditions require, and that its present employees are fully competent to perform their duties. The longer application for employment is delayed by those desiring to enter our service, the less opportunity there will be for such employment. Our desire is, and always has been, to re-employ faithful men who were in our ser- and we will continue to give them preference."

The following are additional particulars of the two newsprint machines ordered from the Dominion Engineering Works, Limited, Lachine, P.Q., by the St. Lawrence Paper Mills, Limited, Three Rivers, P. Q. The machines will have a capacity of from 75 to 80 tons per day. The wires will be 160 ins. by 70 feet long. The press part of the machines is of special design. The suction couch roll is to be of 30 ins. diameter. There will be an 8 roll calender stack, together with a uniform speed reel, and a specially designed re-winder. The machines will be electrically driven, there being 42 dryers of 5 feet diameter. The speed will be 1000 feet per minute.

ST. LAWRENCE PAPER MILLS FORMED

Announcement is made by the Three Rivers Pulp and Paper Co., Ltd., of which N. A. Timmins is the president, is being re-organized and will be hereafter known as the St. Lawrence Paper Mills, Limited.

Shareholders in the old company will receive a like amount of stock in the new company. The Guaranty Investment Company has issued a notice to the shareholders of the old company which says in part:

"Against the delivery of these certificates and the said proxy, the Royal Trust Company has been authorized to issue to you certificates for a like number of preferred and common shares of St. Lawrence Paper Mills, Limited, of the issue referred to in Mr. Timmins' letter. It has been arranged that interest at the rate of seven per cent. per annum, payable helf-yearly on the 1st of July and the 1st of January next, will be paid to you by this company for the current year upon your present holdings of the preferred shares of Three Rivers Pulp and Paper Company, Limited. When the exchange is m ade, dividends upon the preferred shares of St. Lawrence Paper Mills, Limited, will accrue as and from the 1st of January, 1923. The payments for interest due on the 1st of July and the 1st of January next are being provided by the Directors of the Three Rivers Pulp and Paper Company, Limited.

"It is a great satisfaction to us that this financing has been completed, and that the interests of the shareholders have been fully protected."

Mr. Timmins, in his letter to the Guaranty Investment Company, says in part:

"The directors of Three Rivers Pulp and Paper Company, Limited, have recommended the sale and transfer of all the assets of this company to a new company known as St. Lawrence Paper Mills, Limited, for which a charter has already been obtained, and the organization of which is now in course of completion, with the following Board of Directors:—N. A. Timmins, president; Denaston Breakey, vice-president; Ernest Rossiter, vice-president and general manager, J. J. Rankin, secretary-treasurer; L. H. Timmins, Colin Breakey, D. A. Dunlap, R. J. Whyte.

The capitalization of the new company will be as follows:

$1,000,000 eight per cent. Cumulative, Participating, Preferred Shares and forty thousand Common Shares of no nominal or par value.

"It is intended subsequently to make an issue of three million dollars of First Mortgage Gold Bonds, secured upon the properties of the company, the proceeds of which will be utilized to defray the cost of the construction of the newsprint paper mill hereinafter referred to, and for other corporate purposes. I have arranged that all holders of the Eight Per Cent. Preferred Shares of the Three Rivers Pulp and Paper Company, Limited, who may have subscribed for such shares on the public offering which was made in the fall of 1920, or who may have subsequently purchased such shares from the original subscribers, and to have the right to turn in for exchange their holdings of preferred and common shares of Three Rivers Pulp and Paper Company, Limited, and receive therefor an exact equivalent in the Preferred and Common Shares of the new company. The Preferred Shares in the new company will carry the same rights as the Preferred Shares in the old one, i. e., the same dividends, the same voting rights, and the same rights of participation with the common shares in any distribution of earnings after eight dollars per share has been paid upon the latter.

"You will note that the common shares of the new company have been reduced to 40,000 shares instead of 80,000, thereby practically doubling the value of the common shares from the standpoint of equity, but notwithstanding this change in capitalization I have arranged that there is to be no reduction in the bonus of common shares, but that share for share will be given as in the first instance.

"The new company has made its financial arrangements, has made a contract for its paper machines, and expects to let contract for construction of mill by the end of this month. The construction work will be started the first week of June, and it is intended to have one unit in operation by the 1st of January 1923, and the second unit by the 1st of April, 1923. It is designed to produce 150 tons of high grade newsprint paper per day, and it is intended to make it in every respect the most modern paper mill in Canada. The equipment will include grinding capacity sufficient to supply all the groundwood necessary for its own requirements.

"The dividends on the preferred shares of the new company will be cumulative as and from the 1st of January, 1923, and will be payable quarterly.

"I am advised by the company's engineers that when operating at capacity, the proposed plant should be productive of earnings sufficient to meet all fixed charges and other expenses and leave a comfortable surplus of earnings."

ABITIBI BUILT A TUG

The tug "F. H. Anson" was successfully launched at Twin Falls Wednesday, May 10th. She is the finest and most powerful boat built so far in the north country.

She has an over-all length of eighty three feet, with beam of twenty feet, and drive of nine feet six inches. She is driven by 360 H. P. Diessel engine, which uses twenty gallons of crude oil per hour. She is fitted with complete auxiliary equipment for compression of air up to 100 pounds per square inch. This compressor is driven by electricity. The electricity is provided by a 10 K.W. generator, which is used as well for lighting the vessel, running the fire and Bilge pumps and fuel oil pump.

The boat has an oil tank of 3500 gallons capacity, which is supply for ten days' work. The F. H. Anson has a displacement of 200 tons and is exceptionally well fitted for the comfort of the crew both in sleeping and eating arrangements. Her fresh water tank carries 500 gallons.

The boat has a fourteen inch search light of great power, which will be a great advantage in spotting logs and in all night work.

F-0 Rapid and Continuous Process for the Preparation of Paper Pulp. Fr. Pat. No. 523, 871, V. BERNOT and RAYMOND FOURNIER. **Papier,** xxiv, 500-502, (Nov. 1921). The essential points of the invention consist in that the material is subjected to mechanical action when it is still in the liquor and that after the latter has acted for some time, and as soon as the fibers have been isolated, they are removed from the liquor so as to prevent deterioration by prolonged action of the liquor. The advantages claimed are: (1) A single chemico mechanical operation replaces the two operations of cooking and defibering. (2) The production of disincrusted fibers (i.e., paper pulp) can be rendered continuous, thereby reducing the amount of equipment and the labor required. (3) Complete utilization of the liquor, with a consequent decrease in consumption. (4) As the fibers are removed from the sphere of action of the liquor as soon as they have been disincrusted, the tendency to be hydrolyzed is reduced to a minimum. (5) As the defibering is carried out in the liquor itself, deterioration of the fibers is reduced to a minimum. (6) The action of this chemico-mechanical action is such that nearly all natural or artificial vegetable materials can be treated with the same equipment, and that even such fabrics as dirty wiper rags can be treated directly without preliminary washing. (7) As the actual amount of material under treatment at any one time is relatively very small, it follows that it is just as economical to treat a small amount of material as to treat a large amount; and different kinds of materials can be treated successively without having to shut down to clean out the apparatus. (8) As the consumption of liquor is reduced to a minimum, the fibers have little or no tendency to gather into lumps; and when the treatment is carried out at a high temperature the loss of heat is very small owing to the small amount of material undergoing treatment at any time. The raw material is fed into a hopper from which it falls into a cylindrical shell (preferably horizontal), closed at one end, and having a screw throughout its length to make the material travel from one end to the other. The first turn of the screw is made to act as a cutter so as to cut the larger portions of the material. The shell is filled with a suitable liquor. A suitable device is provided to prevent the material from turning with the screw, which would prevent it from travelling forward. The second portion of the appartus consists of a cylindrical box closed at both extremities by means of perforated metal plates, between which revolve blades having either sharp or dull edges according to the results desired. The number of perforated plates and of blades and the diameter and shape of the perforations vary according to the nature of the material being treated. On leaving the apparatus the excess of liquor is removed and returned to the cycle, any losses being made up with fresh liquor; and the pulp is washed and is then ready for use as half stuff. A. P. C.

F-0 Kraft Pulp and Kraft Paper. ARTHUR S. M. KLEIN. **Paper,** xxix, No. 13, 9-12, (Nov. 30, 1921). Observations on the wood, digesters, chemicals and power used in the manufacture of kraft pulp and paper. -A. P.- C.

G-Pulp Treatment

G-5 G-11 K-13 Process and Apparatus for the Concentration and Purification of Half-Stuff and of Paper Mill Waste Waters. Fr. Patent No. [illegible], 491, E. CLEMENT, July 27, 1921. **Papier,** xxv, 15-16, (Jan. 1922). The apparatus consists essentially of a cylindro-conical tank

(Continued from page 459)

containing a series of concentric cylinders which are open at both ends, the length of which increases with the diameter. The tops of all the cylinders are at the same level, slightly higher than that of the tank which contains them. The pulp, or waste water, is fed at the top at the axis of the cylinders. As it passes downwards, on passing from the first cylinder to the second the increase in diameter slows down the speed, which causes a partial separation of the water from the pulp and causes the lighter impurities in the pulp to rise in the annular space between the cylinders. The same thing is repeated at each change in diameter; and thickened pulp rises in the annular space between the last cylinder and the body of the tank, while practically pure water is drawn off at the bottom of the conical portion of the tank and the lighter impurities are removed from the spaces between the cylinders by any suitable means. -A. P. -C.

G-6 Pulp Screen. U. S. A. Patent No. 1,404,566, J. H. BAKER, Jan. 24, 1922. A series of circumferentially arranged diaphragms are used to force the stock against the screen and through the meshes of the drum to the interior thereof. Means are provided for freeing the screen of the tailing. -A. P. -C.

M-General Mill Equipment

M7 The Volume of Air Required in Air Drying. C. T. MITCHELL, J. G. White Engineering Corp. **Chem. Met. Eng.,** xxv, 1088-1090, (Dec. 14, 1921). A discussion of the problems which confront the average engineer in attempting to find the volume of air required in air drying, giving the various factors affecting atmospheric evaporation, and showing how the calculations may be made from wet bulb temperatures and psychrometric tables. Charts are given showing the volume of air required with ultimate air humidity (i.e., humidity of the air coming from the drying chamber) of 70, 85, and 100 per cent, which show the importance of low initial humidity and also that increases in the initial temperature above 110 degrees are not attended with proportionate increase in efficiency. -A. P. -C.

M-0 Apparatus for Evaporating Liquids. U. S. A. Patent No. 1,406,997, P. MULLER, assignor to CHEMICAL FOUNDATION, INC., Feb. 21, 1922. The liquid is sprayed into a chamber in such a manner that the finely-divided material forms a flat layer of mist between two layers of air moving through the chamber just above and just below, parallel to, and in the same direction as the liquid spray; thus effecting rapid evaporation of the water at a relatively low temperature. -A. P. -C.

M-0 New Electrical Systems of Heating Liquids and Solids. Can. Chem. Met., v, 342-344, (Dec. 1921). For heating liquids, a cascade electric heater has been devised, in which the heating effect is obtained by passing the current through the liquid itself, using alternating current to prevent electrolysis. For heating solids, pastes, or very viscous liquids which must be maintained at a fairly high temperature, an induction surface electrical heater is used: by placing a coil carrying alternating current in suitable relation to the surface, the induced current and hysteresis effects generate the necessary amount of heat, and the control of the primary results in perfect control of the temperature. This system can be applied to the dryers of paper machines making it possible to maintain the dryers at any desired temperature most accurately even when subject to variable rates of drying. -A. P. -C.

THE LITERATURE ABSTRACTED

List of Abbreviated and Full Titles and of Addresses of the Journals From Which Abstracts Are Prepared for the Pulp and Paper Magazine, in co-operation With the Committee on Abstracts of the Technical Section of the Canadian Pulp and Paper Association

Am. Lumberman: **American Lumberman,** Manhattan Building, Chicago, Ill.
Am. Forestry: **American Forestry,** 1214 Sixteenth St., Washington, D. C
Analyst: **The Analyst,** 195 Victoria St., London, S. W. 1, England.
Ann. Missouri Botan. Gardens: **Annals of the Missouri Botanical Gardens,** Board of Trustees of the Missouri Botanical Gardens, 10 Depot St., Concord, N. H.

Ber. Deut. Botan. Ges.: **Berichte der deutschen botanischen Gesellschaft,** Gebr. Borntraeger, Schoneberger Ufer 12a, Berlin, W. 35, Germany.
Botan. Abs.: **Botanical Abstracts,** Williams and Wilkins Co., Mount Royal and Guilford Avenues, Baltimore, Md.

Can. Forestry Mag: **Canadian Forestry Magazine,** Jackson Building, Ottawa, Ont.
Can. Lumberman: **Canada Lumberman,** 347 Adelaide Street West, Toronto, Ontario.
Cellulosechem: **Cellulosechemie,** Otto Elsner, Oranienstr. 140-142, Berlin, S. 42, Germany.
Chem. Met. Eng.: **Chemical and Metallurgical Engineering,** Mc Graw-Hill Co., Inc., Tenth Ave. at 36th St., New York City.
Chem. News: **The Chemical News and Journal of Physical Science,** 97 Shoe Lane, London, E. C. 4, England.
Chem. Soc. Trans.: **Journal of the Chemical Society - Transactions,** Guney and Jackson, 133 Paternoster Row, London, E. C. 4, England.
Chem. Zeit: **Chemiker Zeitung.** Walter Roth, Cothen, Germany,
Chem. Abstracts.: **Chemical Abstracts,** Am. Chem. Soc., 1709 G. St., Washington, D. C.
Chem. Soc. Abs.: **Journal of the Chemical Society - Abstracts,** Gurney and Jackson, 33 Paternoster Row, London, E. C. 4, England.
Chem. Age: **The Chemical Age,** 8, Bouverie St., London, E. C. 4, England.
Chimie et Industrie: **Chimie et Industrie,** 49 Rue des Mathurins, Paris, France.
China Clay Trade Rev. **China Clay Trade Review.** 9-10 Southhampton Bldgs., High Holborn, W. C. 2, London, England.
Commerce Reports, Superintendent of Documents, Washington, D. C.

Fiber Containers, 343 S. Dearborn St., Chicago, Ill.
Finnish Paper and Timber J.: **Pappers-bock Travarutidskrift ..for Finland,** Holsingfors, Finland.
French Patents, as reported in the literature.

German Patents: **The Reichspatentamt,** Berin.
Giorn. Chim. Ind.: **Giornale di Chimica Industriale,** Via S. Paolo N. 10 Milan, Italy.

Helv. Chim. Acta: **Helvetica Chimica Acta,** Georg and Co., 10 Friestr., Basel, Corraterie 10, Geneve, Switzerland

Industrie Chimique: L'Industrie Chimique, H. Mounier, 32 Rue Le Peletier, Paris (9), France.
Industria della Carta: **L'Industria della Carta dee Graphiche,** Miano, Italy.

J. Prakt. Chem: **Journal fur Praktische Chemie,** J. A. Barth, 16 Dorrienstr, Leipzig, Germany.
J. Am. Chem. Coc.: **Journal of the American Chemical Soc.**
J. Ind. Eng. Chem.: **Journal of Industrial and Engineering** chemistry, Chas. L. Parsons, 1709 G. St., N. W., Washington, D.C.
J. Chem. Soc.: **Journal of the Chemical Society—Transactions,** Gurney and Jackson, 33 Paternoster Row, London, E. C. 4. England.
ety, Chas L Parsons, 1709 G. St., N. W., Washington, D. C.
J. Forestry: **Journal of Forestry,** Society of American Foresters, Atlantic Bldg., Washington D. C.
J.Pharm. Chim.: **Journal de Pharmacie et de Chimie,** G. Doin, 8 Place de l'Odeon, Paris (6°), France.
J. Royal Soc. Arts: **Journal of the Royal Society of Arts,** G. Bell and Sons, Ltd., York House, Portugal St., England, W. C. 2, England.
J. Soc. Dyers and Col.: **Journal of the Society of Dyers and Colorists,** Pearl Assurance Bldgs., Market St., Bradford, Eng.
J. Soc. Chem. Ind.: **Journal of the Society of Chemical Industry,** Central House, 46 and 47 Finsbury Square, London, E. C. 2, England.

L'Age de Fer: **L'Age de Fer,** 1 Rue Gretry, Paris (2°), France.

Mitt. Materialpruf.: **Mitteilungen aus dem koniglichen Materialprufungsamt zu Berlin,** Lichterfelde West. Julius Springer, Link-Str. 23-24, Berlin, W. 9, Germany.
Monit. Papeterie Belge: **Le Moniteur de la Papeterie Belge,** 68 Rue Edmond Van Cauwenbergh, Brussells.
Monit. Papeterie Francaise: **Le Moniteur de la Papeterie Francaise,** 154 Boulevard Haussmann, Paris (8°), France.

Pacific Coast Lumberman, 702 Pacific Bldg., Vancouver, B. C.
Paper: **Paper,** 251 West Nineteenth St., New York City.
Paper Mill: **Paper Mill and Wood Pulp News.** 150 Nassau St., New York City.
Paper Maker: **Paper Maker and British Paper Trade Journal,** 47 Cannon St., London, E. C. 4.
Paper Makers' Mo. J.: **Paper Makers' Monthly Journal,** 47 Ste. Mary Ave, London, E. C. 3.
Paper Industry: **The Paper Industry,** 356 Monadnock Block, Chicago, Ill., U. S. A.
Paper Trade J.: **Paper Trade Journal,** 10 East Thirty-Ninth St., New York City.
Papier Industri: **Papier Industri,** Kristiania,
Papir-Journalen: **Papir-Journalen,** Papierindustriens Hus, Huitf. gt. 1, Kristiania, Norway.
Papeterie: **La Papeterie, 9 Rue Lagrange, Paris (5), France.**
Papier: **Le Papier,** 16 Rue du Rocher, Paris (8°), France.
Papierfabr.: **Der Papier-Fabrikant,** Otto Elsner, Oranienstr. 140-142, Berlin, S. 42, Germany.
Paper Container: **Paper Container,** 29 Ludgate Hill, London E. C. 4, England.
Paper Making: **Paper Making,** 1 Mitre Court, Fleet St., London, E. C. 4, England.
Proc. Am. Soc. Testing Matls: **Proceedings of the American Society for Testing Materials** American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa.
Pulp and Paper: **Pulp and Paper Magazine of Canada,** Gardenvale, Que., Canada.

Rev. Prod. Chim.: **La Revue des Produits Chimiques,** 54 Rue de Turbigo Paris, (3°), France.
Rev. Univ. Papeterie: **La Revue Universelle de la Papeterie,** 79, Rue du Cherche-Midi (6°), Paris.

Svensk Pappers Tidning; **Svensk Pappers-Tidning,** Svenska Pappersbruksforeningen Hovslagaregatan 3, Stockholm, Sweden.
Seifensieder-Ztg.: **Seifensieder-Zeitung und Rundschau uber die Harz-, Fett- und Olindustrie,** Verlag fur chemische Industrie, H. Ziolkowsky G. m. b. H., Augsburg, Germany.
Trans. Amer. Electrochem. Soc.: **Transactions of the American Electrochemical Society,** Jos. W. Richards, South Bethlehem, Pa.

Technique Moderne: **La Technique Moderne,** 49 Quai des Grands-Augustins Paris, France.
Timberman, 616 Spalding Building, Portland, Oregon.

U. S. Paper Maker: **United States Paper Maker,** 41 Park Row. New York.
U. S. Patent: **United States Patents,** Patent Office, Washington, D. C.

West. Lumberman: **Western Lumberman,** 212 Winch Building, Vancouver, B. C.
World's Paper Trade Rev.: **World's Paper Trade Review.** 58 Shoe Lane, London, E. C. 4.

Wochenblatt Papierfabr.: **Wochenblatt fur Papierfabrikation,** Guntter Staib in Biberach a. d. Riss, Wurttemberg, Germany.
Z. Physiol. Chem.: **Zeitschrift fur Physiologische Chemie** (HoppeSeyler's) Walter de Gryter and Co., Berlin and Leipzig, Germany.
Z. angew. Chem.: **Zeitschrift fur angewandte Chemie,** Verlag fur angewandte Chemie, G. m. b. H., Nurberger Str. 48, Leipzig, Germany.

ALFELCO FACTS

The Albany Felt Co., of Albany, N. Y. has just issued the first number of an interesting little house organ which they call "Alfelco Facts". This number contains the first installment of a very nicely illustrated article on the art of felt making. There is also a suggestive article on The Purchase of Felts and, in the Broke Box, we find a quotation from an article that originally appeared in the Pulp and Paper Magazine and a paragraph telling about some unusually hard treatment that a paper felt received. We are sure that this little paper will receive a welcome among pulp and paper makers.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, May 30.—Conditions in the pulp and paper trades have only slightly changed during the week. If anything, there is a small improvement, taking all departments into consideration. Although paper jobbers report that trade is not brisk, yet the mills, with offices in Montreal, are reported to be working at or near capacity. One mill is considerably behind with deliveries and the orders are still coming in at a good rate. The printing business in the city and district is stated to be of moderate dimensions. There is no indication of a settlement of the strike, although the men are looking for some developments which will be helpful to them.

The demand for newsprint is still strong, with the mills working at high pressure to fill the orders. The interview with Mr. Geo. M. McKee has had the effect of stopping further reports of intended advances in prices. Apart from any other consideration, and advance in prices has a tendency to restrict consumption of any commodity, and although rates may not be sufficiently high to give a reasonable return on the capital invested, it is not always a matter of good policy to raise them.

Trade in fine and book papers is fair. In connection with the latter, it is satisfactory to note that the Finance Minister did not accede to the wishes of the periodical publishers and modify or abolish the duty of 25 per cent. The prompt action of the manufacturers is an indication that they are very alert in defending this important branch of the industry. The British preference duties are reduced, but it must not be overlooked that the additional sales tax will offset these reductions to a considerable extent. In relation to tariff matters, it is of interest to note that in the opinion of Dr. H. P. Baker, executive secretary of the American Paper and Pulp Association, the problem in the States is adversely affecting the paper industry. Speaking last week at a meeting of the Connecticut Division of the Technical Association of the Pulp and Paper Industry, Dr. Baker declared that there a decided disinclination to make contracts for manufactured material for any considerable period in advance owing to the uncertainty with regard to the tariff situation.

Wrapping papers are still dull, while in boards a moderate business is passing, without any particular features. Roofing papers are in better demand, due to more active building operations; waste papers show a slightly firmer tendency; and rags are in good supply.

Conditions in the pulp section are about the same. The orders for bleached sulphite are still very satisfactory ——the Riordon Company's two mills are well employed; in other descriptions the competition keeps strong, with prices down to bedrock. Ground wood is quiet, with, however, a good tone.

Toronto Topics

For the last week there has been noted a brighter tone in general business. This is not definitely traceable to any particular industry or attributable to any outstanding cause. It is probably to logical outcome of the perisistent feeling of optimism coupled with good farm conditions. This was being expressed some days in advance of the budget news, so it was evidently apart from that important factor. The movement, though that is rather a strong term, is evidence of a healthy though very gradual return to generally balanced conditions. It is not well to speak of "a return to normal" meaning a return to pre-war conditions and prices, especially in regard to Canada. We are consolidating a new norm. Our budget reflects the enormous increase of our obligations as a result of the war, but that is not all. We are developing and expanding as an entity in the commerce of the world. Our national overhead is increasing in proportion.

Some jobbers are reporting that better business is being done with rural centers than with the cities.

Comment here on the various items in the budget runs from "iniquitous" to "innocuous". Some are inclined to be jumpy, "viewing with alarm" or "fearing the effect." The "disastrous effect" of having to pay $400 on a million dollar cheque worries some folks, but they are not in the paper trade. The general attitude appears to be that while any increase of costs is disagreeable, the situation must be accepted, and might have been worse, indeed there is a reaction something like relief.

Pulp prices remain nominally the same, inclined to be a little weak. Mills are gradually approaching capacity and prices may be expected to become firmer.

Market continues rather void of features in all lines. The following figures are indicative of price conditions:

Wrappings

No. 1 Kraft. M.F. 8c. M.G. 8.15c.

B. Manilla	$5.50
Fibre Manilla	6.75
No. 1 Manilla	6.75
T Manilla	5.25

Bags

Light manilla and Heavy Manilla: Less 60-20 percent. in 100 m. lots.

Light Kraft: Less 60-20-2 per cent. in 100 m. lots.

Heavy Kraft: Less 70-10 percent. in 100 m. lots.

White Bond: Less 45-10-10 per cent. in 100 m. lots.

Tissues

No. 1 Manilla	24 x 30	$ .80	24 x 36	$1.05
Nat. White	24 x 30	.90	24 x 36	1.25
No. 1 White	24 x 30	1.10	24 x 36	1.55
No. 1 Man. Sulphite	24 x 30	1.00	24 x 36	1.40

Towles

Interfolding, per case, $5.63 net.

Bleached White: Rolls of 150 Towels, 50 Rolls to case 22.00, Less 22 per cent.

Natural White: Rolls of 150 Towels, 50 Rolls to case 19.00, Less 22 per cent.

No. 3 Towels, 13.75, Less 22 per cent.

Toilets

Car lots, Rolls, List less 20 and 25 per cent.

Paper Stock

No. 1 Hard White Shavings	$3.75—3.85
No. 1 Solft White Shavings	3.20—3.30
Heavy Books and Magazines	1.40—1.50
Ledgers and Writings	1.75—1.85
No. 1 Kraft	1.85—2.25
Newspapers	.75— .80
No. 1 Mixed Papers	.60— .65
Miscellaneous mixed papers	.55
Cotton Rags No. 1 White	4.50—4.75
Thirds and Blues (repacked)	1.40—1.50
Roofing Rags	.85— .95
No. 1 White Shirt Cuttings	9.10—9.75
Fancy Shirt Cuttings	3.75—4.50

Canton Flannels bleached	6.00—7.00
White Lawns	6.50—7.90
Blue Overall Cuttings	4.25—5.00
Ropes and Bagging	
No. 1 Scrap Bagging	.75 — .85
No. 1 Manilla Rope	4.25—4.50
Mixed Strings	75—1.15

The market on lower grades of waste paper has shown a much firmer undertone during the past few days than it has for several weeks. Increasing demand by Board Mills and a confident belief by most packers that the demand will soon exceed the supply has advanced the prices on an average of $1.00 per ton. The higher grades including Books and Soft Shavings are moving in good volume with very little change in price. There has been a slightly better tendency in the Cotton Rag market particularly with reference to New Cotton Cuttings.

Roofing Rags are moving fairly well with little or no change in price, although mills have been more willing to place orders than they were a short time ago. There is a fair demand for Manilla Rope.

The wide spread noted in prices of several items indicates that demand is producing a broader range of goods.

NEW YORK MARKETS

New York, May 27.—(Special Correspondence).—There are numerous indications that the paper market is growing livelier and that the movement of paper of nearly all grades into consuming channels is increasing. All branches of the industry are on the move toward broader activity. The situation in raw material alone would seem to prove that paper manufacturers are speeding up their mills, as demand for wood pulp and for rags, old rope, waste paper and the other commodities of which paper is made is exhibiting steady expansion. Dealers in these materials report that not in a long time have they witnessed the inquiry as now exists from consuming quarters and say that sales to mills are assuming very large volume.

Moreover, there are many concrete signs of a broadening of trade in paper. Printers and publishers, department stores and business concerns, and various other consumers are ordering paper in appreciably larger amounts than in quite a period, and paper mills are kept comparatively busy in turning out enough of their product to fill the wants of jobbers and direct consuming buyers. It is expected that the Federal Trade Commission's monthly review of the paper industry for April, which is due to be issued within the next several days, will show a further increase in production during that month in proportion to the sharp jump in paper output in March.

Prices on print paper are distinctly firm. Manufacturers are having no trouble in getting full established prices at a basis of 3.50 cents per pound at mills, and publishers are keeping things active by constantly being in the market for additional supplies, frequently ordering newsprint to augment their contract supplies. Talk of an advance in print paper prices has stopped but nearly everyone in the trade is of the opinion that prices are at bottom levels for sometime to come. There are those who express the belief that it is not at all unlikely that newsprint will rise in price in the fall, basing their views in this connection on the probable higher cost of production at that time when manufacturers will be obliged to run on higher-priced pulp wood. Certainly higher prices for newsprint are not out of the realms of possibility especially should demand continue at its present rate and should importations from Europe continue to drop off in like ratio to that of the past several months.

Another active branch of the paper industry are the

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MEXICO AND CUBA FOR

Finnish Cellulose Association
Helsingfors, Finland

AND

Finnish Wood Pulp Union
Helsingfors, Finland

fine paper mills. Demand for various grades of bond and ledger papers is broadening every day, reflecting to a pronounced degree the improvement in business generally, and mills up in New England and in other parts of the country producing fine papers are keeping busy and are finding it necessary to increase their output. It is estimated by representative members of the trade that the fine paper mills are now operating at something like 85 per cent. of capacity, which is indeed very favorable when it is considered how these mills have increased their equipment during the past year or two. Fine paper prices are firm and in most cases are gradually moving upward. No sharp advances have occurred but manufacturers frequently are announcing slight raises, prices being readjusted according to raw material fluctuations and consequent manufacturing costs.

There is also an increasing demand for book papers, and this division of the industry seems to be at last developing more normal activity. Publishers are buying in larger tonnage, and there is a much broader demand from the jobbing trade. Prices are steady although there is still much room for improvement in this connection; some mills are accepting orders at low prices, which gives the market an uncertain tone.

Tissues are steady in price at around 85 cents a ream for No. 1 white tissue f.o.b. New York, and are in good demand. Wrapping papers are moving in routine volume and at maintained quotations. The board market is fairly active though considerable complaint is heard among manufacturers about the low level of prices. Plain chip board continues to sell in New York at $32.50 to $35 per ton f.o.b. this city, and filled news board at $35 to $37.50 a ton.

GROUND WOOD.—The tone of prices on ground wood seems a little steadier than it did a few days ago. This apparently is due to improvement in demand from consuming quarters. Not that paper and board manufacturers have not been absorbing ground wood in comparatively good amounts for some time past, but lately there has been a somewhat keener demand, which has served to firm the market tone slightly notwithstanding that present supplies of mechanical pulp are quite large. Prices most generally mentioned range between $31 and $32 per ton f.o.b. domestic grinding plants for prime spruce ground wood, freshly ground, for prompt shipment, with purchases from Canadian producers reported down to $27 a ton at pulp mills but with the additional freight involved bringing the cost of this pulp to American consumers up to about the same levels as prevail on domestic ground wood.

CHEMICAL PULP. — Most reports say that chemical pulp is meeting with a fairly good sale. Consumers are noticeably confining their purchases to supplies needed against direct requirements, but in the aggregate a better movement of pulp is being effected than in some time. Were it not that available stocks are rather heavy, the probabilities are current demand would be sufficient to cause a considerable advance in prices, but buyers now know that both domestic producers and importers have good stocks on hand and are guaging their orders so as not to excite the market and cause any stiffening of quotations. Sulphite of practically all kinds is moderately active and steady in price. Domestic bleached sulphite of No. 1 grade is quoted at around 4.50 cents a pound at pulp mills, and foreign No. 1 bleached at from 4 cents upward ex dock at New York or other American Atlantic ports. Reports have been received of some sales of foreign unbleached sulphite at low price levels, but indications are most of the pulp in weak hands has been disposed of, and quotations are now firmer at around 2.50 cents a pound for No. 1 imported unbleached. Kraft is steady at from 2.75 cents a pound upward for No. 1 domestic, and around 2.65 cents on the dock for Scandinavian kraft.

RAGS.—The papermaking rag market is gradually taking on a firmer undertone. This is due both to increased inquiry from consuming quarters and to the decreasing stocks in dealers' and packers' establishments. Graders say it is becoming quite a problem to replace rags when they are sold to mills, and such concerns as have stocks on hand are inclined to hold them, particularly since sentiment in the trade is in favor of at least a slight rise in values shortly.

PAPER STOCK.—Waste paper of all kinds is steadily stiffening in price under a good demand from consuming mills. Packers and dealers assert that they are not getting more than 50 per cent. of their normal amounts of old paper under present circumstances, and therefore display a more or less independent attitude and insist on the prices quoted when making sales. Soft white shavings have advanced further in price, sales up to 3.60 cents a pound f.o.b. New York having been reported in some cases, with dealers in general holding for at least 3.50 cents at shipping points. Old books and magazine have sold at 1.55 to 1.60 cents a pound New York, establishing a new high price level for this grade, and old No. 1 kraft paper rules firm at around 1.70 cents a pound.

OLD ROPE AND BAGGING.—Further advancement has occurred in prices on old rope. Demand from paper mills has shown no abatement, and dealers have reported receiving better than 5.25 cents a pound at shipping points for manila rope in No. 1 condition, with talk heard in the trade of transactions up to 6 cents. About 5.25 to 5.50 cents appears to be the prevailing market value of rope, however, though supplies are limited at this basis.

Scandinavian American Trading Co.
50 E. 42nd STREET.
NEW YORK
CHEMICAL MECHANICAL WOOD PULP FOREIGN DOMESTIC

Pulp and Paper Magazine

OF CANADA

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J. NEWELL STEPHENSON, M. S., Editor.

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:-: EDITORIAL :-:

ENOUGH IS PLENTY

There are at present, at least 8 new paper machines on order and under construction and 3 in course of erection for Canadian mills. The range includes fine book papers, boards, saturating felt, and newsprint. On top of this rather extensive program, there come rumors of more construction. We seriously question whether it is the best thing either for the paper industry or machinery builders to assume a further burden of construction just at the present time. Concerns that have been practically idle except orders for replacements of auxiliary machinery and ordinary repairs when they might have been anticipating some of the present rush by clearing away preliminary details had some mills possessed the courage to have placed their orders earlier, are now swamped with work. To add further in the shortest possible time to the number of machines under construction would have a tendency to bring a lot of new product on the market in a lump and cause a period of excess production that would not only make it difficult to market anything like full capacity of the mills, but would cause another spell of suspension of machine building that would mean another period of comparative idleness for these concerns. On the other hand, if the people considering extension of present plants or the building of new ones would look forward a little bit and plan not to have their new production come on the market until after the production of the machines under way at the present time could be expected to be fairly well absorbed, we should have more uniform and stable conditions and avoid that wide fluctuation in production, consumption, and employment which has always had a serious effect on any industry in which it occurs.

To our mind, the proper way to extend the pulp and paper industry in Canada is for a round table discussion of all conditions affecting the market by all of the mills interested in each particular grade together with any parties contemplating the manufacture of such papers. Such a conference, provided with charts and other data showing the trend of consumption over a period of years, could calculate the amount of new capacity that should be provided and the time when new production should come on the market. Consideration in such a discussion should be given to the percentage of capacity at which mills were operating during the period under review.

We thoroughly believe in the expansion of the pulp and paper industry in Canada but we are convinced that such expansion as occurs should take two important factors fully into consideration. One of these is the amount and availability of raw material, particularly wood supply, and second the possibility of the market consuming from 80 to 90 per cent. immediately of new production on the basis of present plants then operating all at well over 90 per cent. There is no good reason for the establishment of plants which cannot be operated efficiently and profitably and afford continuous employment to those engaged in the business. We are all suffering from over development of the coal mining industry in the U. S. There is more capacity than can possibly be kept busy more than 75 per cent of the time and the result is high price coal due to an over balance of overhead together with uncertainty of production and dissatisfaction of employees because of interrupted employment.

No doubt there are some who will not agree with what we have just said but we feel sure that a little contemplation of the matter will convince them that such a policy as we have outlined will be best for all concerned. It will distribute employment in machine design and building, in mill construction, and later on in mill operation and it will stabilize production at a profitable percentage of capacity and stabilize market conditions. Of course, mills operating at the present time or at any time will not be likely to encourage further competition, but new mills are sure to be built and we feel that it will be a whole lot better for the industry if those who are bent on entering it do so with at least a partial measure of that good will and cooperation which exists among mills now producing. The time to begin this business of cooperation is when the new mill is being planned.

DID YOU EVER DO IT

We heard the other day that the present Premier of Ontario, Hon. E. C. Drury, was addressing a gathering not long ago and asked what seemed a very simple and almost foolish question. The question he asked those in his audience was "Have you ever read a book?" and the astonishing answer to this simply query was that practically two thirds of the people present had never actually read a book; most of them had studied through the arithmetic, they had read passages here and there in the school reader and had no doubt also read most of the geography and history books, but they had never actually sat down with the idea of getting the message from a book carefully read.

A person who has not cultivated or acquired the ability to read understandingly and enjoyably, is not only missing one of the greatest pleasures and comforts of life but is shutting out, whether deliberately or unintentionally, one of the greatest assistants and one of the most potent factors in mental development. To be able to read and to understand and enjoy what one reads, brings to one's elbow the experience of the ages and the wisdom and advice of the best minds that the world has produced. Only the best survives in books, although much that is transient appears and passes. Some of the transient is interesting and instructive but the best of literature is what remains and is read from year to year.

There are roughly two kinds of books that are worth while reading, those which are read for enjoyment and those read for instruction. There is no need of an attempt to specify or even suggest books that are worth while in either of these classes. Any book store offers a wide choice and most magazines carry advertisements of new or special titles. Trade publications are glad to furnish names of books dealing with their particular industry. For instance, in the pulp and paper industry a number of very good books have appeared quite recently. We fail to see how anyone in a pulp and paper mill can expect to make satisfactory progress without a study of such books on the subject as are available. They cost less than experience and we venture to say that money spent in books, if they are carefully studied will result in such an increase in efficiency that promotion resulting from recognition of better work will more than repay the investment. It is natural to speak of the pulp and paper industry but what is true of this business is true of others. The man who depends entirely on his own experience to help him go forward, is working pretty much in the dark. It is true that we learn by mistakes but progress is much more rapid when mistakes are avoided. The way to avoid mistakes in mill experience is the same principle as involved in avoiding a rock in the road; the first essential is the know it is there. A book is like a light on the road.

So we urge purely as a matter of personal interest on the part of each man in the industry, that he read three kinds of literature; books of general interest, books especially dealing with the pulp and paper industry, and one or more trade journals which bring the latest in technical developments and news of general conditions relating to the manufacture of pulp and paper. And we know that habits of reading, whether for pleasure or advancement which are formed now, will bring the greatest comfort in later years when physical activity is necessarily curtailed or when a person is in a locality that does not furnish as many opportunities for wasting time as are provided by larger communities.

COBWEBS

It is said that a Chinese artist may spend 20 years carving a piece of jade. How many of us take such infinite pains in carving our characters?

"You cannot take a bright view of life through a glass eye," says the Safety League.

WHERE WE ARE GOING

Annual Summer Meeting, Technical Section

Iroquois Falls, Ont. June 19-23, 1922.

ITINERARY

Monday, June 19

Hours refer to Standard Time in case of railways. Daylight saving time prevails at Iroquois Falls.

8.45 P.M. Leave Toronto, Union Station, via Canadian-National-G. T. R.

9 P.M. Leave Montreal, Bonaventure Station, via Canadian-National, G. T. R.

(Special sleeper from Montreal,Regular sleeper from Toronto.)

Tuesday, June 20

6.40 A.M. Toronto passengers arrive North Bay.

8.50 A.M. Montreal passengers arrive North Bay.

(Toronto party to transfer at North Bay to Montreal Special Sleeper.)

9.10 A.M. Leave North Bay, T. and N. O. Ry.

(Breakfast, Lunch and Dinner served *à la carte* in dining-car.)

6.25 P.M. Arrive Iroquois Falls.

(Special sleeper will be dropped from train at Iroquois Falls and kept for accomodation of party. Overflow, if any, will be provided with hotel accomodation at Iroquois Falls.)

7-10 P.M. Preliminary visit to Abitibi mills under guidance of staff.

Wednesday, June 21.

7-9 A.M. Breakfast at Iroquois Hotel.

9.30-12 A.M. Inspection of mill, preceded by an explanatory and descriptive address by the management.

1 P.M. Luncheon at hotel, tendered by the Abitibi Power and Paper Company.

Address of welcome by Mr. R. A. McInnis, general manager.

2 P.M. Transportation will be provided for those who wish to visit the new power plant at Twin Falls. The mill will also be open to further inspector. Opportunity for tennis and other sports will be provided for those who prefer them.

7 P.M. Dinner. By special invitation of members of Abitibi staff.

(In the evening guests will have the opportunity of witnessing a Northern Ontario Baseball League game. An informal smoker and entertainment will follow.)

Thursday, June 22.

7-9 A.M. Breakfast at Hotel.

1.15 P.M. Entrain for North Bay.

(Luncheon and Dinner served *à la carte,* on route.)

10.30 P.M. Arrive North Bay, connecting with train to Toronto.

Friday, June 23

7.40 A.M. Arrive in Toronto.

9.55 A.M. Arrive in Montreal.

R.R. fares and sleeper accommodation will be paid for collectively through the Secretary of the Section.

Meals on the train and at the Falls, except as otherwise indicated, to be paid for individually.

Details of the Program at Iroquois Falls to be arranged by the company's representatives.

Mr. A. P. Costigane will meet members making the trip from Toronto at the train in the Union Station, and will be provided with the necessary transportation and reservations.

The Secretary will arrange for reservations and transportation for members leaving from Montreal and will meet them at the train in the Bonaventure Station.

Manager's and Foreman's Responsibilities

By Roy J. Murbach, The Gardner and Harvey Co.,
Middletown, Ohio

In dealing with this subject one must bear in mind that good management of plants, means better safety records, therefore, I will speak mostly of the management's relation to his employees.

The day of personal contact is a thing of the past in the majority of plants. Formerly, when plants were small and a manager ruled one or two hundred men, he was personally acquainted with every man in his establishment and they understood him. In those days, if the men had any grievances, they could have a talk with the "Old Man," as managers were then called, to settle their troubles. To-day, conditions have changed. The manager no longer has time to encourage the workmen with a greeting or a handshake. Instead he very often hands the workmen a printed notice; there is therefore no personal touch between the two. It is, however, far from possible for a manager to cater to the interests of each individual or settle all grievances among his men and still keep his mill running. Even should he try it, he would soon find the day far too short to accomplish all his work. At the same time the men who were not given consideration would soon feel that partiality was being shown by the management. For this reason, it has become necessary to divide the men into groups in all large plants, placing one man who is directly responsible to the manager in charge of each group. I have taken the word "foreman" to designate these men, although this term includes superintendent, master mechanics, chief engineers, etc. I will ask you to bear in mind that throughout this paper "foreman" refers to the men who must report directly to the manager, and by the managers, I mean the men who are directly responsible to the president for the operation of the plant. As I said before, plants are too large for the manager to know all the men personally, but they are not too large for him to know all of his "foremen" and for him to be responsible for the kind of "foremen" in his employment.

Managers Should Have Minds of Their Own

Managers should be men who have minds of their own, and be capable of aiding in the making of decisions by the foremen. If he is a man who is easily influenced by "smooth" talk, the chances are that some of the foremen will take advantage of him. This will lead to hard feelings among the "foremen". Therefore, several important items for him to consider are: First, to sincerely endeavor to give his foremen a "square deal"; second, to treat them as partners in the business; third, to give much thought and energy to their training because he must rely upon them to such an extent.

When a manager promotes a man from the ranks or employs a new foreman, he should call a meeting of all the foremen. At the meeting, he should introduce the new man, stating his position and ask all of the foremen to cooperate with him in helping the new man to get acquainted with the conditions of the plant. The manager should outline the work for the new man and explain fully what is expected of him. If the foreman is employed from another mill, it should not be taken for granted that he knows his job. Regardless of the kind of work and the similarity, there are no two plants in which the conditions are the same and it takes a new man several days to become acclimated to the new surroundings. If he has the assistance and cooperation of the manager and other foremen, the work will be much easier and he will soon feel at home. When selecting a man for a vacancy, it is always more desirable to advance a man from the ranks when at all possible, because he is thoroughly familiar with the methods used; is in harmony with the spirit of the mill and his promotion is an encouragement to his fellow workmen.

Should Not Feel Superior To His Foremen

Let us now discuss the kind of manager who feels himself superior to his foremen. The chances are when he employs a new man he will make him feel his position at their first conference. He will not be introduced to his fellow foremen and the feeling of good fellowship which should be obtained is not created. Instead of cooperating with the new man the men often play a joke on him when he asks for some information about the mill or else they will take the attitude that the new man is "butting in" and they will give him the "cold shoulder." I dare say, that under such management there will always be discord among the men and the foremen have the "I don't care" attitude.

If the manager chooses careless foremen, he cannot expect to operate his plant on a safe and efficient basis. I would say that the manager is directly responsible for the safe and efficient operation of his plant, because he has charge of the choosing of men for the head of his various departments. This is not an easy task, for foremen should be placed wisely in regard to safety as well as skill. It may be that a man may be better qualified to handle electrical hazards or chemicals, etc. This should be taken into consideration, unless the organization is so arranged that the safety engineer is responsible instead of individual foremen. All hiring of men who are to work in the different departments should be left to the employment bureau or the foreman, as the case may be. A manager should not give a friend of his a job without first discussing the matter with the employment bureau and the foreman under whom this man is to work. Nor should the applicant ever know that it was the manager who obtained the job for him. Because in such cases a man very often does not take orders from his foreman seriously or else takes his time to carry them out.

Meeting Place for Managers and Foremen

Every plant should have an auditorium or some available meeting place for managers and foremen. Meetings should be held at least once every month with the honest intention of the manager to give his foreman a "square deal." At these meetings subjects of operation, safety and new problems should be discussed. Experiences, statistics and reports should be compared. This gives the foreman pride, credit for work well done and furnishes a stimulant for better results and perhaps a higher goal at which to aim. This place for meetings should not be for foremen alone; it should also be for the representatives of the great mass of working men. What the working men really want is self-expression and they should have the right to discuss and share in the adjustment of matters affecting their own interests—thus the solution will come by itself. In most cases a mass meeting of all the men would not be possible or practical, but it is possible for the men of each department to choose a committee of their

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* Delivered at the meeting of the Paper and Pulp Section, Tenth Annual Safety Congress of the National Safety Council, Boston, Sept. 26-30, 1921.

best men to meet with a committee of the management to discuss subjects which take deliberation.

A large field in which the manager can show true interest in his foremen and workmen is the social field. Not many years ago this was practically unheard of, but today, it has become one of the essential developments of all plants. Under the social field there are many phases to be considered as for example group insurance, recreation and amusements, the housing situation, health of employees and their families, lunch rooms, rest rooms, groceries with minimum prices, charity for the absolutely needy, etc. Every manager should make a study of the conditions surrounding his men and their families and sincerely endeavor to obtain all he possibly can for them.

Now then, let us take the foremen's relationship to the plant. As has been said before, this includes all men who are directly under the supervision of the manager.

Should Have Pleasing Personality

A good "foreman" possesses a pleasing personality and is not a "grouch". He should be a leader of men and not a driver, for the days of driving men are past. An amiable man can get more cooperation from his men than the one who would be termed a "bully". It used to take a husky man to be a foreman, but today it takes a quick-witted man who can understand human nature, who treats every man as all individual and does not regard human labor as something which can be bought and sold as machines and raw material. The foreman should be well enough acquainted with his men to be able to call them by their first names. An employee usually feels nearer to you, if you can call him by his first name of his "nick-name." A distinction should, however, be made between friendliness and familiarity on the part of the foreman. The responsibility of his men's work rests upon the foreman, consequently he must be responsible for their actions. When a foreman takes on a new man, he should call all the men of his department together and introduce the newcomer to them and then explain just what is expected of him—the working hours, etc. The next step would be to take the new man through the mill, to point out to him the dangerous places and then allow him to work with another man who is thoroughly familiar with the lant, for a few days. Thus the liability of accidents would be reduced. Safety has to do with the safeguarding of human lives. No phase of the foremen's work is so important as this. The foreman should be made to feel that he is a protector of human life, that he can prevent men from being maimed and crippled, and that his mistakes are apt to be sad ones. He should be kind-hearted and patient, and quick to see things which endanger life and limb. It is also the duty of the foreman to make material conditions so safe that the workmen can do their tasks without abnormal care. After the new man has started working, the foreman should study him carefully to see if he is fitted for the place and to learn whether he is a reliable, or careless, shiftless workman. As I stated before, the foreman has the responsibility of selecting his men, this should be the case in every mill, although they have an employment bureau which hires and "fires" his men. In no plant should the foreman be compelled to take a man sent him by the employment bureau against his wishes, although the candidate might be a good man, in some cases it would be impossible for him and the foreman to agree. If a foreman does not act in harmony with one of his men, he should report the fact to the employment bureau that the man may be transferred to another department. Good work cannot be expected where there is discord. This discord may be between only one man and the foreman but if allowed to continue, soon spreads throughout the department. This will cause the men to think less of their foreman as a leader because they will see the dissatisfied one "getting by", while doing less and poorer work.

Should Study Human Nature

The foreman should study human nature or the psychology of human nature that he will be better able to handle each man individually. Some men require a command in order to accomplish certain duties while the willingness of others must be secured in a different manner. Then too there are cases of reprimanding which must be considered when men make mistakes or "loaf on the job." Some men need speaking to rather "roughly" while with others it is sufficient just to remind them of the fact that they have made a mistake or are wasting time.

A foreman should always be glad to explain the best way of doing work to his men. If the men are unfamiliar with the work, he should show them that he is not afraid to work, but should always allow the workmen to solve problems for themselves. He should always be open to suggestion from his men and always encourage self-expression, because there are many capable men under the foreman whose suggestions might prove valuable because they are in the thickest of every-day battles, where suggestions naturally arise of which the foreman would never think.

The foreman should not boast to his men of what he has accomplished and how he once did things, nor should he take all the credit for the efficient and safe operation of his department or neglect to mention the name of the man who made a worthy suggestion when reporting to the manager. A good foreman will show by some reward, a good word or a slap on the back, that he appreciate good work.

I have only touched on some of the points of the subject, for I feel that much more could be said. It summarizes down to the fact that the right kind of man is necessary to assume all of the responsibilities of a manager or foreman. Of course the manager is responsible to the president for the proper and efficient operation of the plant. When you speak of the operation of the plant, you speak of the responsibility of every person working in the plant and the machinery.

The foreman is directly responsible to the manager for the safe and efficient operation of his department. His responsibilities are of a smaller scope because he has fewer persons and less machines under him, but his task is more difficult because he has to deal with less intelligent labor.

THE FOREST PRODUCTS LABORATORY A DECENNIAL RECORD

In commemoration of the recently celebrated tenth anniversary of the Forest Products Laboratory at Madison Wis., there has been published a very fine book of 196 pages which gives the history of the institution and a description of the Laboratory and its wonderful facilities for the study of the utilization of forest resources in every lin of industrial work and includes an account of the decennial celebration. All of these speeches are excellent reading and it would well repay anyone connected with the pulp and paper industry to invest $1.75 which merely covers the cost of publication in this review. There are some very fine illustrations of the equipment of the laboratory. There are a few institutions that have done more or are likely to do as much for the paper industry as the Forest Products Laboratory at Madison. It is hoped that this record of achievement will help those who hold the purse strings to see the need and advantage of a little more generous support of such a worthy government department.

A Dictionary of Pulp and Paper Mill Terms

(Continued from last issue)

Please mention any errors to the editor.

Boot Boards. Specially hard boards prepared from waste papers and tough fiber, used for the insoles and heels of boots. Frequently toughened by the addition of pulped leather clippings.

Borax. A weak alkali (sodium biborate, $Na\ B\ O_4\ 10H\ O$) used as a solvent for casein in coating for paper. Sometimes used in de-inking process.

Bowl. Special soft paper used for making rolls or bowls of paper, required in the supercalender machine. Made solely of or from mixtures of soft rag, wool, asbestos, beaten quickly and not sized. Made from the waste of flax spinning mills, unsized, bleached or unbleached, used for the paper rolls in calendering machines, where there are alternate rolls of compressed paper and chilled iron. (Bromley). In some instances the paper has been partially parchmentized.

Bowls. Calender rolls made of paper. Disks of paper with hole in center, placed on edge and mounted on a shaft—set up by screwed washers at each end.

Box Board. A stiff paper made from straw, mechanical pulp, sulphite or sulphate pulp for making paper boxes or cartons. Some grades must be of specified bursting strength.

Box Enamels. White or colored coated papers of the cheapest description, used for covering boxes. Coated on one side only and very highly glazed.

Break. A rupture of the continuous sheet of paper running on a paper machine. May be a "wet" or "dry" break, depending on its location on the machine. A "wet" break is that occuring at the couch or on the presses. A "dry" break usually refers to one at the calenders or at the reel.

Breaker. See **Beater** and **Potcher.**

Breaking Length. Such length of a strip of paper, of stated width, that its weight, suspended freely would break the strip. The factor of tensile strength commonly used in Europe determined by the Schopper strength tester.

Breast Roll. The roll, usually of gun metal, carrying the wire at the end of a fourdrinier machine next to the flow box.

Bright Enamels. Enameled papers, coated on one side only, finished with a high polish produced by calendering. Used for labels.

Bristol. A special form of board first made in Bristol, England. Used for plate printing, menu cards, calendars, and high-class advertising. Made of rag stock alone, rag and bleached sulphite, or sulphate only. Fourdrinier machine used and preparation of surface commences from the wire and must be carefully attended to throughout the process. Hot pressing is not now depended on for surface. **Index Bristol** is ink resisting and smooth without gloss. **Wedding Bristol** must be free from gloss. When gloss is required, the surface prepared as above needs only increased pressure. Inferior grades, sometimes on a cylinder machine, contain a filler or cheaper material, even mechanical pulp, sandwiched between two thin layers of higher grade.

Broke. Refuse paper. In general, that produced during the operation of the paper machine, either wet or dry, produced at beginning of operations, or as a result of breaks in the sheet, on account of imperfections or while making adjustments. "Wet broke" is that accumulating at the presses. "Dry broke" at the calenders, reel and winder. See **Machine broke; Finishing broke.**

Browns. Brown wrapping paper of every description: Rope browns, Air dried, Cylinder dried. Air-dried browns are more flexible and durable than machine dried browns.

Buff Printings. Ordinary printing paper colored buff, the tone being produced generally by iron salt added to the stock in the beater.

Burner

(1) The pan, revolving cylinder, retort or other form of furnace in which sulphur is burned in sulphite acid plants.

(2) The long revolving cylinder in soda and sulphate recovery plants in which the black ash is produced; known as the rotary burner.

(3) In a boiler room the dutch oven in which the woodroom refuse is fired; otherwise, "refuse burner."

Burr. A tool used for roughening the the worn face of a pulp grindstone by pressing it against the moving face of the stone. The surface of the burr is covered with various cutting patterns, about a quarter of an inch deep, which are reproduced on the grinding face of the stone. Variations in the surface patterns have been found to have important effects on the ground stock, both in yield and quality. See **Thread burr, Straight burr, Spiral burr, Diamond point.**

Bush Roll. See **Burr.**

Bursting Strength. The resistance of paper in pounds per square inch, usually referred to in percentage of the weight per ream of paper tested. The test is made on Ashcroft, Mullen or District of Columbia instruments.

Butter. Papers used for wrapping butter, lard, and similar greasy goods. Usually some cheap form of vegetable parchment or its substitutes. Imitation parchment.

C

Cable Papers. Also called insulating papers. Made from manila, jute and sometimes all wood pulp. Some are unsized and some are hard-sized. Strength is essential.

Calcium Bisulphite. See **Bisulphite of Lime.**

Calcined Lime. See **Caustic Lime.**

Calcium Carbide. (CaC_2) a compound made by subjecting a mixture of quicklime and carbon to the heat of an electric arc. In contact with water, acetylene is produced.

Calcium Carbonate. Limestone ($CaCO_3$), marble, chalk, calcite, calc**spar.**

Calcium Hydroxide. See **Slaked Lime;** also called calcium hydrate. Milk of lime.

Calcium Hypochlorite. See **Bleach.**

Calcium Oxide. See **Caustic Lime.**

Calcium Sulphate. A compound ($CaSO_4\ 2H_2O$) found in nature as a mineral called gypsum or alabaster. Prepared artificially, it is called crown filler or pearl hardening. Used in papermaking. See **gypsum** and **gyps.**

Calcium Sulphite. $CaSO_3\ 2H_2O$, or "mono-sulphite" of lime the salt formed by sulphurous acid in contact with an excess SO_2. It is the first step in the production of calcium bisulphite liquor. Insoluble in water but dissolves in acid.

Calender. A set or stack of superimposed rolls of steel, or alternately steel and paper rolls, through which paper is passed from top to bottom for the production of a smooth surface thereon, and to improve the printing or other surface properties of paper. See **Super Calender.**

Calender Cuts. A defect in paper. The split edges of wrinkles in the paper web nipped in the passage through the calenders.

Calendered. Paper having a smooth and more or less polished surface imparted by passing through the calender. Opposed to rough or unfinished.

Calender Spots. Defects caused in paper by spots of oil or particles adhering to calender rolls. Sometimes caused by the effect of the calender on damp spots in the paper.

Calf. A more or less embossed stout paper, colored to suit fancy, made to imitate leather. Used for bookbinding to imitate leather.

Campeachy Wood. See **Logwood.**

Canada Balsam. A pale-colored oleoresin obtained from the Balsam fir (Abies Balsamea). Used by woodsmen for treatment of light cuts and abrasions. Used for mounting objects in preparing permanent microscopic slides. Its refractive index is 1.53, which is nearly equal to glass, and in addition it hardens with age.

Canary Yellow. See **Lead Chromate.**

Cannabis Sativa, Hemp. A plant grown in India yielding fiber of great strength. It comes to the paper mill in the form of canvas, sailcloth, ropes, etc., and is the basis of rope stock. Used for special bag, cable and insulation papers. Cannot be readily bleached to a good color.

Cap

(1) A metal covering to screw on the ends of piping or place over ends of shafts, etc.

(2) Abbreviation for foolscap, a writing paper sheet. There are several "cap" sizes in both writing and wrapping papers. See **Sizes of paper.**

Carbide. See **Calcium Carbide.**

Carbolic. Paper impregnated or surfaced with a mixture of stearin and carbolic acid. Used as a wrapping paper for food, in special cases—not in contact of course. **Poisonous.**

Carbon Paper. Usually, used for the production of duplicate copies of letters, bills, etc. Surfaced with a mixture of lamplack or coloring matters and substances, such as wax, soap (better) or fatty oils. It consists of a paper with a coating of color, ground in an oily or waxy medium, applied to one or both sides of the sheet. The pigment, for the black, mauve and blue carbons, is largely composed of lampblack, but other coloring materials are used. The paper is unrolled from the web, passing through the machine, and the color applied to the surface and brushed to rub the coating into the paper. Passing over heated and cooled cylinders, the paper receives its finish and is reeled and allowed to mature.

Carbonate of Lime. Limestone. See **Calcium Carbonate.**

Carbonate of Soda. Soda ash. See **Sodium Carbonate.**

Cardboard. Thick paper used for cards, a loose term generally applied to thick still paper, or to the stiff board obtained by pasting a number of layers of paper together.

Cards

(1) Pasteboards, ivory boards, and pulp boards are cut into desired sizes,, and put up into packets of 52 and 1,040.

(2) A term used of chips in a chemical pulp mill to describe a broad mass of chips, but of the desired length. A slice of wood.

Carpet Felt. A soft, thick, spongy, paper used between floor and carpet. Prepared usually on a multicylinder machine from common waste paper, rags, and similar residues.

Carriage Panel. Hard stiff boards made from waste paper, etc., very heavily pressed. Frequently hardened and stiffened by vulcanizing. Used for ceilings of railway and other cars and to some extent automobile parts.

Carron Oil. A mixture of equal parts of lime water and cotton seed, or olive oil, used in treatment of burns. One of the indispensables in a first-aid cabinet.

Carton Pierre. A French term meaning **stone card.** An imitation stone prepared by molding pulp or waste paper into various shapes under pressure. Used for theatrical properties and similar objects.

Cartridge. A strong paper originally used for cartridges, now used for rough drawing. There are several standard sizes in the trade, that known as "cartridge size" being 26" x 21."

Casein. A compound obtained by precipitation from skim milk, using dilute acids in excess. It is insoluble in water, alcohol or ether. Soluble in alkalis, alkali carbonate, strong acids, and borax. Used as the adhesive in preparing coatings for paper.

Casing Paper. Special Wrappings, usually waterproof. See **Sizes of paper.**

Cassie. A term once used to describe the few outside sheets of a ream of paper. From the French word, **Casse,** broken.

Catechu. A natural dyestuff obtained from certain species of Acacis, Areca and Uncaria, growing in India. Gives brown, olive, gray and black shades.

Cathode. See **Kathode.**

Caustic. Biting, corroding. The hydroxides of the alkalis and of lime are so-called from their possession of this property. Commonly used for caustic soda in solid form.

Causticizing. Treatment of soda-ash solution with quick lime to produce caustic soda. The final treatment in preparing the cooking liquor in a soda or sulphate mill.

Caustic Lime. Quicklime, Calcium oxide (CaO), prepared from limestone or marble, by heating in kilns to a temperature exceeding 825 deg. C. Sometimes referred to as Calx. Opposed to slaked or hydrated lime.

Caustic Soda. Sodium hydroxide, NaOH. A strong alkali. The active agent in the cooking of pulp by the soda process, and the chief agent in cooking by the sulphate process. One of the by-products of an electro-bleach plant producing Chlorine.

Cellophane. A thin transparent film simulating paper, used for wrapping purposes and made from a solution of cellulose, as viscose or cellulose acetate.

Celluloid. A cellulose product obtained by mixing camphor with nitro-cellulose. The camphor is dissolved in alcohol and the nitro-cellulose added. It is then worked between rollers and warm pressed. It is inflammable, but not explosive. The nitro-cellulose is called pyroxylin. It is sometimes a nitrated paper and is a mixture of tetra—and pentanitrate of cellulose.

Cellulose. A solid carbohydrate found in the structure of plants, having the form of long thin cells and constitutes the fibrous raw material for paper making. It is a definite chemical compound, whose molecule is an unknown multiple of $C_6H_{10}O_5$, and is generally written $(C_6H_{10}O_5)x$. In cotton the purest form is found. The common term for chemical woodpulp.

Cellulose Acetate. Compounds, three in number, varying in molecular content, prepared by treating cellulose with acetic acid in the presence of sulphuric acid. After further treatment it is sometimes formed into threads and used for the manufacture of an artificial silk. It is not inflammable and thus is a safe material for moving-picture films, for which it is used to some extent.

Cement.

(1) To cause to adhere or stick.

(2) In building work—a fine powder prepared by grinding a sintered mixtured of clay and lime having the property of setting to a hard rock-like mass, with proper admixture of water.

Centigrade. See **thermometers.**

Centrifugal

(1) The action of a force tending to throw liquids or solids away from a revolving center.

(2) A machine by which liquids are separated from solids by the use of centrifugal force. A centrifuge.

Centrifugal Pump. See **Rotary Pumps.**

Centrifugal Screens. See **Screens.**

Centrifuge. See **Centrifugal.**

Chance Sulphur. See **Recovered Sulphur.**

Charging Floor. In a chemical pulp mill, the floor below the chip loft, where the operation of loading the digester is carried out.

Chart

(1) A strong tub-sized rag paper of medium surface, used for charts and maps. Inferior qualities are made from woodpulp. It is specially treated so as to stretch as little as possible. Must be strong, pliable, tough, resistant to wear, and at the same time have a good printing surface.

(2) The record of an operation or period of time as by a recording thermometer.

Checker Work

(1) Bricks or blocks so laid that spaces are left between them for the passage of gases or liquids which in so doing are retarded, mixed, or made to yield their heat.

(2) Reclaiming tower of a Sulphite Mill.

Chemical Pulp. Wood pulp produced by the sulphite, sulphate, or soda processes, as differentiated from mechanically prepared pulp obtained by grinding wood.

Chenick. A term sometimes used in the textile trade for solution of bleaching powder.

Cheque Papers. Good quality of bond paper, specially made for strength.

Sometimes of chemical pulp, but usually all rag. Some cheque papers contain chemical compounds which render alterations or erasures easy of detection.

Chest. The vat or tank equipped with an agitator holding the reserve of paper stock. Referred to as "machine chest."

China Clay. Kaolin, silicate of alumina, found in nature and used as a paper filler on account of its whiteness and other physical properties. Chief sources, Cornwall, England, and the Southern United States.

China Grass. See **Ramie.**

Chip
(1) To produce chips.
(2) A small piece of pulp wood prepared for digestion and produced in the chipper, which see.
(3) A term to indicate a certain quality of paper board made from waste paper.

Chip Loft. That portion of a chemical pulp mill, holding the chip bin, and usually directly above the digesters.

Chipper. A machine consisting of a frame and a heavy metal disk on a shaft rotating vertically with knives mounted obliquely in its face. Used in a chemical pulp mill for cutting pulp wood blocks into chips.

Chip Screen. A revolving or shaking strainer, receiving the chips from the chipper for classification by removing the saw dust, splinters, and oversize chips.

Chloride of Lime. Bleaching powder See **Bleach.**

Chlorine. Cl_2. A greenish gas of pungent odor produced by electrolysis of salt solution. Absorbed by dry lime, it yields bleaching powder. Fibers previously boiled in caustic soda are readily bleached when exposed to chlorine gas. Liquid chlorine is now transported in tank cars or cylinders for convenience in preparing bleach at the mills from milk of lime.

Chlorophyll. The green coloring matter of plants.

Chromate of Lead. See **Lead Chromate.**

Chrome Yellow. A coloring material consisting of lead chromate, produced in the beater by the use of sodium chromate followed by lead nitrate.

Chromo. A heavily coated paper used in chrome-lithography. The body is usually a stout paper of sulphite and soda. The surface is somewhat dull and more absorbent than an art paper. The term is derived from the Greek word meaning color.

Cigarette. A specially made tissue, unsized, containing little or no loading material.

Cloth-Lined Paper. Cotton cloth, equivalent to scrim or common muslins, according to quality, having a paper facing. Cloth centered paper has thin paper pasted on each side, while "clothed backed" papers are of better quality, with a fair quality of cloth on the back. Cloth-lined cards (linen-lined) are thicker than papers. Surface-enameled cloth-lined cards are first made as cloth-backed cards and then enameled with the colored coating and plate-glazed.

Coal on Specification. The purchase of coalon a stated basis of heating value and quality determined by analysis or operation.

Coal-Tar Colors. So called because the color materials are derived from organic substance found in coal-tar. See **Aniline colors.**

Coated
(1) Paper which has been covered with a special surface, brushed upon it.
(2) To cover with a special mixture composed of casein and mineral matter, colored or uncolored. The casein is rendered soluble by the use of borax or other alkali.

Cochineal, Carmine. The dried bodies of the female insects Coccus Cacti, formerly used as a coloring matter for paper and in solution as a chemical indicator.

Cockle. A wave at the edges of a sheet of paper, or small wrinkles caused by uneven drying.

Cocoanut Fiber. See **Cocus Nucifera.**

Cocos Nucifera, Coir. Used only for matting, sometimes to cover drainer bottom; not being suitable for paper.

Coils
(1) Paper for various purposes, such as telegraphs, time-recording machines, cash registers, music rolls, wiping the die in relief stamping, and for printing small forms on the reel.
(2) Papers slit from the full reel, and rewound on centers suitable for the machine or other spindles.
(3) An arrangement of pipes for gas or liquid to be cooled or to impart heat.

Coir. See **Cocos Nucifera.**

Collar
(1) Paper prepared from cheap wood pulps, surfaced with linen muslin heavily coated with mineral matter and highly glazed. Used for paper collars.
(2) A metal ring clamped on a shaft to maintain it in proper longitudinal position.

Collodion. A solution of nitrated cellulose in alcohol and ether.

Collotype Printings. Thick papers or boards made of rags or a mixture of rag and esparto. Surface generally a little rough. Must be fairly hard sized to resist the damp surface of the jelly used in printing.

Colombier. See **Sizes of Paper.** Frequently termed Columbia. The word is French and means pigeon-hole.

Colophony. See **Rosin.**

Color. The degree in which a surface absorbs or reflects light.

Columbian Spirits. Methyl Alcohol—Methanol, Methyl hydrate.

Compensating. A balancing of forces, restoration of conditions. An appliance that balances effects.

Cone Drive
(1) See **Marshall Drive.**
(2) Equipment by which the speed of a machine may be varied although driven by a prime mover of constant speed. It consists essentially of two cone-shaped pulleys connected by a belt which may be moved along the cones, thereby varying the final speed.

Conifer. A tree of shrub belonging to the order **Coniferse,** so called because the fruit is a cone, as in the pine and firs.

Constant Speed.
(1) Non-varying motion.
(2) That portion of the paper machine of which the speed is not varied; e.g., driving the screens and stock pump.

Conveyor. A mechanical appliance traveling in a more or less horizontal position to move materials, such as blocks of pulpwood, in a trough, by a wire cable with flights (which see); chips, usually on a belt, without flights, or coal chains and flat scrapers or buckets if the conveyor is inclined. There are many varieties, See **Elevator.**

Cook
(1) A unit of production in pulp mills referring to the number of digesters discharged as "thirteen cooks in 24 hours."
(2) The contents of a digester, as "raw or burnt cook."
(3) The man in charge of operations in the digester house of a pulp mill.

Cooking
(1) The treatment of rags or chips with steam, chemicals and pressure.
(2) The period from "pressure up" to blow off in digesting pulp.

Cooler. Apparatus consisting usually of antimonial lead pipes submerged in water, used for cooling the burner gases in the acid plant, and the relief gas and liquor from the sulphite digester.

Copperas. See **Ferrous Sulphate.**

Copper-Sulphate. Bluestone, Blue Vitriol $CuSO_4$ $5H_2O$, a blue crystalline salt used in water treatment, and electric batteries.

Copying. Used for the manufacture of letter-books, for copying. A special tissue paper, thin, strong, unsized but usually glazed. Buff Japanese paper is specially suited for this purpose.

Corchorus Capsularis. Jute, an Indian plant, the fiber of which is used for manufacture of coarse sacks and bags. Among raw materials used by paper makers are the used gunny and sacking.

Cork Paper. Used for packing glass and fragile goods, consisting of heavy coarse paper surfaced with a mixture of glue and powdered cork.

Core
(1) The hollow spindle of iron pipe wood or paper, upon which a roll of paper is built up.
(2) In patterns, a hole in a casting to be provided for by the pattern maker. See **Tap.**
(3) The internal revolving cone or plug in a refining engine.

Core Bar. One of the bars inserted in the core or plug of a refining engine. These bars act in a similar way to those of the beater roll. They are set up against the shell bars by a screw actuated by a hand wheel.

Corrugated Paper. The corrugation is effected by running the dampened paper between meshing gears and afterward dried, the corrugated paper being glued or pasted to a flat web of similar paper, usually for shipping containers. Commonly the thinnest strawboards are used, but for better classes white papers are employed.

Cotton Linters. See **Linters.**

Cotton Sampling. White or colored wrappers used for the display of packing of cottons and cotton goods. Made from strong fibers, such as jute, soda, wood and rag.

Couch Roll. A felt-covered roll running on the wire or cylinder, which takes the formed paper away from the wire and carries it over the presses. This refers to the top couch roll in a fourdrinier machine which has also a bottom couch roll of gun-metal around which the wire travels and on which the top couch roll rests. See **Suction Couch.**

Cover. Thick heavy rag or wood pulp paper, rough machine finished and soft sized, used as covers.

Crayon. High class heavy rag paper, tinted or plain colored, glazed on one side only. Used for crayon drawings, water color and sepia drawings.

Cream. The very light tints of brown.

Cream Laid. An ordinary writing paper of creamy color, made on a laid wire mold, or on a machine provided with a laid wire dandy roll.

Crenothrix. One of the algae which grows rapidly in iron water pipes, sometimes completely blocking them. See **Algae.**

Crepe. Paper simulating crepe. The effect is produced by crowding the wet sheet on a roll by means of a doctor. Strong sulphite makes best grades, but mixtures with mechanical pulp may be used. The creping is made coarser or finer by changes in furnish and handling.

Crinkled Tissue. Common tissue, plain or colored, crinkled by specially embossed rolls.

Cross. A pipe fitting having four outlets at right angles.

Cross-Head. That part of a reciprocating engine or pump which connects the crank rod to the piston rod.

Crotolaria juncea. See **Sunn Hemp.**

Crown
(1) A progressive increase in diameter from the outer edges toward the center, as on a pulley to hold belt in place, or on a heavy roll to compensate for sagging between bearings or compression due to pressure.
(2) See **Sizes of Paper.**

Crown Filler. A paper making material produced by reaction between sodium sulphate and calcium chloride. See **Pearl Hardening** and **Calcium Sulphate.**

Crown Sheet. That part of a boiler over the fire box.

Crush. To pass a wet sheet of paper or pulp between rolls or presses under too high pressure. Resulting in a "crowding" effect or breakage.

Cudbear. A coloring matter obtained by the action of air and ammonia on certain lichens. It is very little used in papermaking.

Cuprammonium. A bluish solution of copper oxide in ammonia, which has the property of dissolving cellulose. This property is taken advantage of in the preparation of "Willesden" water proof and other products.

Cutlery. Common woodpulp or jute paper, prepared so as to ensure freedom from acid compounds, or substances likely to produce hydrogen sulphide. Anti-tarnish papers.

Cutlery Ropes. A term applied to cutlery papers made from hemp or old rope.

Cutter. A machine used to trim paper to size in the flat. There are two kinds, one known as a rotary cutter, cutting sheets from rolls and the other other usually known as a "trimmer", usually known as a "trimmer," cutting stacked sheets of paper of considerable thickness into smaller size. See **Duplex cutter.**

Cyclostyle. Tissue waxed paper used for cyclostyle work.

Cylinder Mould. A cylinder covered with fine meshed wire, revolving in a vat of paper or pulp stock in such a way as to catch fibers on its surface and allowing the water to pass through the facing. See **Couch.** In pulp mills used as a dewatering machine.

Cylinder Part. That portion of a board machine wherein one or more cylinders take the place of the wire of fourdrinier machine.

Cymene. (Cymol $CH_3\ C_6\ H_4\ CH_2\ CH_2\ CH_3$). A colorless, transparent liquid with a pervading aromatic odor. Spec. gravity, 0.862; boiling point, 174 deg. C. It is the chief constituent of the so-called sulphite turpentine, obtained as a by-product in the digestion of sulphite pulp. It is not a true turpentine. Physically it makes a good substitute for turpentine in paints as a thinner, but its use is prejudiced by odor. McKee (J. Ind. & Eng. Chem. June, 1921) suggests the use of cymene in fat splitting.

D

Damping Rolls
(1) Small perforated cylinders or pipes laid across the paper machine, by which moist steam is brought to the web in its passage at calenders or elsewhere.
(2) Rolls cooled internally with water, on the surface of which the moisture of the air is condensed. The web of paper in contract with such rolls is dampened for calendering.

Dandy. A hollow roll of proper diameter covered with wire cloth, resting and revolving on the wire between the suction boxes. Any desired pattern may be woven into or applied to the covering and because it stands out on the face of the roll its outline is impressed on the wet paper, which upon drying is slightly thinner and more transparent on the lines of the pattern. The pattern or design so produced is the true "watermark."

Dandy Mark. Defect in paper caused by a mesh or meshes of dandy roll becoming filled, causing stock to be picked out, and leaving a hole or imperfection in the sheet of paper.

Decker. Apparatus for removing part of the water from paper or pulp stock, consisting of a vat, cylinder mould, and couch roll, but without a felt. The fiber adhering to the couch is scraped off by a doctor. So called from its designer.

Deckle-Edged. Paper made to simulate hand-made paper, by leaving untrimmed the rough edge produced by the deckle.

Deckle Strap. The endless rectangular rubber band which defines the edges of the paper being formed on the fourdrinier part and keeps the stock from running off the wire at the sides.

Deckle
(1) Movable wooden framing round the wire mould in making paper by hand.
(2) The ragged edge on hand-made paper.
(3) The distance between the deckle straps on a fourdrinier machine or the width of untrimmed paper being made; e.g., narrow deckle or 160 inch deckle.

Decorticate. To remove husks or linters from cotton or other seeds—from "cortex," the bark.

Defective. Incomplete, having some part missing, or badly made.

Degras. See **Lanolin.**

Deliquescent. Having the property of taking moisture from the air, hygroscopic. Bleaching powder, Salt and Calcium Chloride are examples of deliquescent materials.

Demy. See **Sizes of paper.**

Devil. A machine for removing dust and dirt from rags.

Dewater. Taking water out, or reducing the water content of stock Pulp thickener. Decker.

(To be continued.)

J. R. Booth's Remarkable Career

Seldom does one read a more interesting biographical sketch than the story of J. R. Booth as written for MacLean's Magazine by Charles Christopher Jenkins. It will be read and enjoyed by everyone connected with the paper industry, because Mr. Booth has been a strong man and a pioneer in this industry for many years. No one commands and deserves greater respect and affection than is felt for him by the thousands he has employed, touched and befriended. He is now an old man—95—but we trust that as long as he lives he will be blessed with the keenness and vigor he still enjoys. Editor.

If at the outset one were to seek for the golden key to the tremendous successes of John R. Booth, the mightiest of all the big timber kings of this continent, he would surely discover it to have been an abiding faith in the future of his native Canada, a faith that was fixed and unswerving when other men seriously doubted that the struggling young British colony of the fifties would ever grow to merit its swaddling clothes as a self-governing Dominion within the Empire. Booth is one of the few history makers of those days left to remind us of the intellectual giants who conceived and made come true the dream that is our Canada of today. Like some tall pine of the forests from which he took tribute is John Rudolphus Booth — left standing alone in patriarchal grandeur when others of his day and generation are gone and forgotten.

Still An Active Figure

Like the lone pine of the one-time forests, this grand old man of the roaring fifties and sixties shows little change in mien and habits with the passing of time. Today were you to pay a chance visit to his mammoth pulp and paper factories at Ottawa, you would no doubt encounter in the yards somewhere, a sturdy figure, medium of stature and slightly stooped, with a face framed in snow-white hair and beard that would remind you of chiselled granite. Now and then you would see him pause in his strides and hear him issue curt, incisive orders, his steel-blue eyes snapping fire, orders which mill-men and yard-men alike are quick to fulfill; for, as in the days when he wielded the cant-hook and rode logs on the river with his men, his commands are final. The law of this iron man has ever been, "When I want a thing done, I want it done the way I say it should be done." There is no alternative, the over-man who fails to comply to the letter the orders of the Big Boss might as well at once seek employment elsewhere. His close attention to his business has, no doubt, deprived him of opportunities to see the world and its wonders and of well earned relaxation when he could quite as well have shifted minor responsibilities to others.

But the world beyond the zones of Booth activities and expansion holds no sustaining charm for John R. Booth and never has. The twin gods of the material world to whom he pays tribute are Work and Achievement. While he is stoical, dogmatic, domineering and self-opinionated so far as the conduct of his business is concerned, he is almost totally without that conceit which makes some men picturesque and lovable and others merely ridiculous. Other men cannot appeal to his imagination or his vanity as a successful means to an end — unless that end has a distinct possibility of advantage to the Booth industries. He detests eulogy and shrinks from publicity with the shyness of a schoolboy.

Some Stories

Though reticent and distinctly reserved in the presence of strangers, he is noted for his deftness at repartee. A story is told of a stableman who attended to Mr. Booth's horse at one of his customary stopping-places up country to whom he usually gave a ten cent tip. One evening the stableman thought to suggest an increase in his honorarium.

"Mr. Booth, sir," he opened, "did you know that you only gave me ten cents?"

"What's that?" demanded Mr. Booth.

"You only gave me ten cents," repeated the hostler. "Now your son, sir, never gives me less than a quarter."

"My son is better off than I am", replied the magnate as he climbed into his buggy. "You see, he happens to have a rich father."

Another story is told for whose veracity I cannot vouch, but it goes to illustrate the modesty and simple tastes of the man. Following injuries received in a fall in his yards, Mr. Booth went to a well-known American sanitarium for expert treatment. There he registered as "J. R. Booth, lumberman." The hospital authorities, taking it for granted he was a worker in a Canadian lumber camp, thought to make his bill as reasonable as they possibly could and fixed it at a couple of hundred dollars. But when Mr. Booth went to pay up he drew out a roll of bills of such large denominations that the office staff stood aghast.

MR. BOOTH

"The lumber business must be pretty healthy these days, Mr. Booth," remarked the manager.

"Pretty fair," replied the patient.

"By the way, what lumber company are you with in Ottawa!"

"I am with the Booth Mills."

"You are a foreman there, I suppose!"

"No," quietly replied the other. "I am the owner."

Since then, it is said, the management of that particular sanitarium has been diligent in looking up the rating of every quiet appearing patient lest the institution be again treating some Canadian multi-millionaire unawares.

Though he has been ready to spend hundreds of thousands of dollars in public-spirited enterprises that benefited Ottawa and the country as well as bringing in greater revenues to his own businesses, and, though he contributed toward the construction of the Ottawa Y.M.C.A. building, furnished funds for an addition to St. Luke's hospital, now known as the Booth wing, and otherwise aided laudable undertakings, Mr. Booth is not a philanthropist in the sense that other millionaires have been. His conviction is that the best way to help others is to give them opportunity to help themselves. His own experience was that he got nothing from the world, that he did not work and strive for with little or no relaxation from the grind of duty.

The Human Side

Nevertheless old-timers recall incidents that throw a light on his notion of charity—though J. R. Booth probably would not designate it by that name. Back in August, 1910, the Booth mills were shut down through the strike on the Grand Trunk Railway. Two thousand men, many of them with wives and families, were thrown out of work. After seven days of idleness the regular Booth pay day rolled around. The first man in the long line of workers who stopped at the cashier's wicket opened his yellow envelope and gave a gasp of surprise. The next gave a shout of joy, and soon the small army of workmen who came with gloomy faces wondering how two week's expenses were to be paid out of one week's pay was turned into a happy, singing crowd. Each found his envelope to contain full pay for the week the railway strike had thrown him out of work.

Another instance is told of an old lumber-jack who was brought down with penumonia. In the night while this man lay on his bed of fever and his family sat up mournfully watching his unequal struggle with the Grim Reaper, there came a light tap on the door of the little cottage, which was opened to admit the sturdy, stooped figure of John Rudolphus Booth, who brought with him a simple, old-time remedy. He had the patient wrapped in red flannel and insisted in sitting by the bedside and nursing him until a turn for the better came and he was on his way to recovery.

Though he has ever been a plain-living man of simple personal tastes the career of John R. Booth teems with color and big things. The empire of timber limits which his armies of lumber-jacks conquered with axe and saw is believed to include more than four thousand square miles.

The first of those virgin forests, which he acquired in 1867, known originally as the Egan Estate Limits, is still producing. Lumbering was his business, but because others had not faith enough in the future of railways to make the investment, and, because he must have them to get his products to the world markets, Mr. Booth financed and built railways himself, roads, which, when he had proved their earning power, he sold to splendid advantage. Wise men, wealthy men and even royalty have called at Ottawa to meet this sturdy Canadian who rode logs in the river as a youth and lived to have his own private car on his own steam roads. His Majesty, King George the Fifth, once "broke bread and shared salt" with the Dominion's greatest lumberman. That was when the present King was still a Prince and on a visit to Canada. His Majesty enjoyed a ride on a crib of squared timber with Mr. Booth through a lumber slide on the Ottawa, after which the royal party were the guests of the timber king at a dinner of "pork and beans" served in a log shanty at Rockcliffe, which shanty is to this day known as the Royal Shanty.

Robert Dollar, the Canadian who became the well known millionaire ship-owner of San Francisco, and who is believed to be the prototype of the "Cappy Ricks" stories, at a dinner given in Ottawa some little time ago recalled that one of his first employers was John R. Booth. Booth was at that date — 1858 — a shingle manufacturer, and Dollar worked by the day packing shingles for him.

His Early Days

John Rudolphus Booth was born in Shefford County, Eastern Quebec, near the site of what later became the Village of Waterloo. He was the son of Canadian pioneers of North of Ireland stock, and grew up as a hewer of wood and drawer of water on his father's homestead. It was not until after his marriage to Miss Rosalina Cook, his wonderful life's helpmate, whose demise occurred in 1886, that he heard the call of the outer world and shook the dust of Shefford County from his shoes. The rush of adventurous Canadian manhood in those days was to the States, and Mr. Booth, in company with his wife, and with nine dollars in his pocket, went to the State of Vermont, where he first secured employment as a carpenter. For three years he was mainly engaged working by the day as a bridge-builder, when he become convinced there was no big future in the job. He packed his tools and left for Ottawa. That was about the year 1857, when Ottawa was still living down the name of Bytown, an inconspicuous town in the Canadian wilderness.

It is told that Mr. Booth first worked in Ottawa as a shingle-splitter, walking three miles to and from his work. Shingles in those days were split from pine and cedar blocks with a broad-axe, one man placing the axe and another striking the head of it with a heavy wooden maul, the shingles being afterward graduated by being run through a mechanical shaper. Ottawa was then beginning to hear the hum of awakening industry. Lumbering was in its infancy and E. B. Eddy had promoted the nucleus of what later became an industry known in every Canadian household from the Maritimes to the Pacific Coast. The Bronsons were cutting timber and there were two small mills operated by Perley and Pattee, and Philip Thompson. The amber-colored Chaudiere bearing the mountain waters from the unexplored hinter lands roared and swirled through Ottawa in majestic defiance of man's right, little dreaming that the rugged youth who daily walked its banks and seldom smiled had come to subjugate its tumbling furies and bend its mighty energies to nation-building.

Booth subsequently worked in a machine shop and helped to build the Leamy sawmill at Leamy's Lake. When the mill was completed he was made manager, a position which he held for a year. This was the first recognition of his executive ability. Shortly afterwards he opened up in business for himself with a machine shop, but his plant was burned down after being eight months in operation. His next venture was a small shingle mill, which he vacated because the owner of the land on which it stood sought to double the rent, when Booth started to make a little money.

Following this latter venture he established his first mill on the site where his enormous pulp and paper enterprises operate today. He opened his mill with a single saw and almost at the start was successful in securing a contract for supplying lumber for the new parliament buildings. He succeeded in handling this contract at a handsome profit, and later, in order to expand, he took a partner. In the early sixties the American Civil War broke out, with its aftermath of hard times. During the slump, Booth's partner lost his nerve and wanted to quit, Booth refused to quit and by one means and another so financed matters that he was able to buy his partner out and continue the business alone. Almost immediately afterwards business on both sides of the international line commenced to pick up again and J. R. Booth started on his real career to accumulate millions.

Mr. Booth has a superabundance of originality and courage. He was the first lumberman on the Ottawa to use horses for hauling logs and supplies in the woods, and other operators who employed oxen exclusively looked upon the Booth experiment as foolhardy. He next amazed his rivals by bringing in a crew of longshoremen to work in the bush for him. They set him down as plain crazy — as a wild dreamer who was courting swift financial disaster. But Booth's horses soon proved their supremacy over oxen on the tote-roads and the winter-trails and his "dock-rats" put old-time lumberjacks to shame with their daring and skill at riding logs on the rivers.

Booth enterprises flourished and expanded like things so ordained by Destiny. He gained the confidence of great financial institutions, and, when several large tracts of timber, including the splendid John Egan Estate, were put on the market, he readily obtained backing from the Bank of British North America to secure them. His first limit is said to have been purchased for $45,000, a mere fraction of its actual worth, with money which he secured from the bank at seven per cent. He extended his mills and bought more and more limits until fifty years later it was conceded he owned a larger area of pine forests than any other one person in Canada. By the year 1892 his mills had a capacity for turning out over one million feet of lumber in ten hours. By working two shifts of men, the mills were capable of turning out two million feet in a day of twenty-four hours, exceeding considerably the maximum output of any other plant of its kind in the world.

Rising from the Ashes

In the month of May, 1893, this splendid mill was burned to the ground, but almost immediately afterward Booth bought out the old Perley and Pattee mill on property adjoining and fitted it out with modern machinery. He established a lath and a picket mill and shingle and boxboard mills. More than fifteen hundred men were employed in the new works and nearly half a thousand wagons were kept busy conveying the lumber from the mills to the yards. A good half of the products was shipped to the English market, and in those days the lumber was loaded on river boats and towed to Montreal where it was transferred to ocean liners for transportation over the Atlantic. The balance of the lumber was sold in this country and the United States, Mr. Booth having established a yard at Rouse's Point as early as 1867, a move that proved his far-sighted vision as a captain of industry. In 1875, he established a mill and sorting yard at Burlington, Vermont, with sales offices at Boston, Mass. He is said to be the only Canadian lumberman who manufactures his own lumber in his own United States mill. The American branch was first under the management of ex-Governor U. A. Woodbury, of Vermont, and since his retirement has been conducted by Colonel E. J. Booth, a half brother of John R. The box factory in connection with this latter mill alone handles five million to six million feet of lumber a year.

During his career, John R. Booth met with a series of disasters, any one of which might have daunted ordinary business courage. Two more great fires ravished his property after the fire of 1893, one in 1900 and another in 1903. Millions of feet of valuable lumber were lost in these conflagrations, the first laying waste his magnificent stone residence on Wellington street as well. The net result of these set-backs was fresh determination on the part of the owner and further expansion of his enterprises, for he soon afterward added a pulp and paper mill to his factories, a mill with a daily capacity now of 200 tons of groundwood pulp, 90 tons of sulphite, 140 tons of newsprint paper, and 55 tons of boards.

It is said of John R. Booth that in all his struggles to make good in the face of great obstacles he never asked other men for financial assistance and even refused the offer of certain exemptions in taxation when he was planning to rebuild plants destroyed by fire. When another fire destroyed his planing mills at Burlington, Vermont, the council of that place fearing they might lose the industry, proposed a ten year exemption. Booth rebuilt the mill but never claimed the exemption.

His Railway Experiences

But while Mr. Booth invariably refused favors that might interfere with the independence he exercised and held an inalienable right in the conduct of his business, he is just as tenacious in refusing to relinquish any property or privilege that he believes to be justly and legally his. This latter trait he particularly exemplified in the building and selling of railways. A lumberman, first, last and always, he became involved in railway construction because he needed steam roads to rush his products to the markets. American capitalists started to build the old Canada Atlantic back in the later seventies, and Booth, anxious to see the road completed as a quick outlet for his goods to the States and the seaboard, made them a considerable loan. The original promoters floundered into worse difficulties, and finally Mr. Booth took active control and built the road himself, completing it in 1882. This venture was followed by an extension from Ottawa west, then known as the Ottawa and Parry Sound Railway. Both roads he later sold to the Grand Trunk System, now the Canadian National, for $14,000,000. But before that deal took place Booth's railways had opened up vast new territory and made history in Canada. At the time the Grand Trunk acquired the Booth system it was handling something in excess of 200,000 tons of flour and package freight and 20,000,000 bushels of western grain. It was equipped with sixty-seven locomotives, forty-one passenger cars and three thousand freight cars. This railway had lessened the distance between Montreal and Chicago by eight hundred miles and shortened the inland haul to and from the Liverpool market by four hundred and fifty miles.

When Booth was building the Canada Atlantic he was voted a bonus of fifty thousand dollars to bring it into the city of Ottawa, but, through exigencies over which he had no control, he was behind time in completing the road. When his steel reached the end of Elgin street, he applied to the city council for his fifty thousand dollars. He was refused on the technicality that the road was not completed on the specified date. Nothing daunted, and keeping his own counsel, Booth put steam shovels to work and literally dug out a pathway for his railway into the heart of Ottawa, using the dirt excavated to make new land in what was then a marsh in the south end of the city. On that site he located his round houses. He put up a small building to serve as a station, and one day took the aldermen down to see it. "Now," he said, "I have carried out my agreement, don't you think you ought to pay me the bonus that was promised!" The council paid over the fifty thousand, taking it for granted the small shack Booth had put up was only to serve until he put up a real railway depot. But when they later approached Mr. Booth about it he said: "There's your station as you accepted it when you paid over the bonus." He refused to replace it, they had driven a hard bargain with him and he saw no reason to do more for them than the contract demanded.

PAPER MULCHING FOR PINEAPPLES

Mr. Charles Franklin Eckart, whose process for making paper from bagasse (sugar cane refuse) and its use as a mulch for sugar cane and pineapples, has granted exclusive rights to the latter phase for the territory of Hawaii to the Hawaiian Pineapple Co. of Honolulu. The licensees are permitted to sub-license. The process has been described in the Pulp and Paper Magazine.

British Trade News

(From Our London Correspondent)

London, May 23, 1922.

Some weeks ago I commented on the policy of some of the British paper producers giving their delegates, or travellers, going overseas a big "send-off" in the shape of a farewell dinner—and some explicit instruction regarding establishing agents, new business,—or tariff, if possible —as well as inquiring into future business prospects. It is a most excellent policy for developing export trade and I commend it to Canadians who want to expand trade. Mr. Henry Godfrey, of John Dickinson and Co. Ltd., the big English paper mill owners, who are never lacking in enterprise and "go", has just returned from a successful business tour in India, Australia, New Zealand, and other places. Canadians can reckon that he did not go there for pleasure and health. His firm have come to understand the local conditions prevailing, the wants of the markets, — and what is the result? Today Dickinson's mills in all sections are speeding-up; they are working full time on newsprint and finer papers. As an enterprising firm, the head personnel adjust themselves to meet the post war conditions, the results of the economy "axe", and buyers paucity methods abroad. Their success, naturally, follows in the train of adjustments and the success of the financial side is reflected in a 7½ p.c. dividend to the holders of ordinary shares. These expeditions abroad are splendid tonics for exports, but they want careful planning and good men, who will be backed up by the firm. I mention this case of Dickinson and Co. Ltd., to let Canadians know that through these expeditions little events like the new Preference Tariff in Australia, for British paper, spring out of them and it stands to reason that "stay-at-homes" do not develop industry.

One for Canada

Viscount Northcliffe was entertained at a luncheon in London the other day by some of the Australian newspaper owners and magnates of the colony. Speaking on the question of labor, Viscount Northcliffe said: "I am not one of those who take a gloomy view about Australia, though I confess it is not a booming country like Canada. Canada has not tied herself up with ridiculous labor agreements, with basic wage nonsense, with constant agitation about labor by people who know nothing about labor. Canada has not made the price of labor so high and the hours of labors so light that she cannot be an exporting country, which is true of Queensland. How can Queensland compete with the rest of the world, or go ahead, with the preposterous regulations she has? She cannot—and never will.

There is one remarkable feature of the British exports for April, full particulars of which have just been issued by the customs, and that is the shipments of printing paper to Canada. The paper may be going to agents, or it may be going to customers direct; at all events, in 25 days, 51 tons were sent to the Dominion, compared with seven tons in March.

The total export trade of printings, boards, etc., from British mills and factories in April reached 138,174 cwts, compared with 137,935 cwts in March and 119,201 in Feby. All foreign countries are buying small quantities and there have been good shipments of printing paper to France, India and Australia. Packing and wrapping papers show a falling-off when compared with March, the total being 18,526 cwts—a reduction of 4,259 cwts, but an increase of 5,000 odd cwts on Feby. Cardboard, straw and mill boards increased to 4,463 cwts the highest figures for 1922 as yet.

Canada is buying very little writing paper from British sellers. Shipments are down to the lowest ebb, and next to nothing. The total shipments from all British sources to oversea markets were only 9,929 cwt. Tissues have have also declined in the export trade and the same may be said of roofing paper.

Jump in Pulp Imports

The imports of pulp for April reached 43,257 tons, compared with 28,886 tons in March and 20,167 tons in Feby.

Groundwood was received as follows:—From Canada nil. (Jany to April 30, 7,700 tons); Sweden, 6,756 tons (14,810 tons); Norway, 17092 tons (59,845 tons). Total groundwood received from all countries 24,328 tons (82,860 tons Jany-April, as against 87,176 tons in 1921).

Bleached Sulphite: From Finland 184 tons (Jany-April, 386 tons); Sweden, 103 tons, (99 tons); Norway 550 tons (3,344 tons); Germany, nil (275 tons); other countries 160 tons (450 tons). Total: 997 tons (5,453 tons, Jany to April).

Unbleached Sulphite: From Sweden, 3,147 tons (20,506 tons); Finland, 5,808 tons (11,016 tons); Norway, 6,097 tons (13,420 tons); Germany 550 tons (784 tons); other countries nil (1,638 tons). Total: 15,602 tons (47,344 tons Jany-April).

Groundwood, dry: 1,330 tons from all sources, the total for 4 months being 1,862 tons.

Chemical, wet: 1,000 tons, making 2,967 for the four months, compared with 889 tons for the corresponding period in 1921.

There is a good demand for groundwood and prices are unchanged. Sellers of chemical and easy bleaching wish there was the same demand for sulphite and sulphate pulps.

Packing and Wrappings

The consumption of packing, wrapping, and tissue papers in the United Kingdom is great, from what can be seen by superficial figures; but if the actual figures were really obtainable one could say that the consumption was enormous. During April the imports reached 207,191 cwts (850,264 cwts for four months of a dull year); March 294,234 cwts; Feby. 155,167 cwts.

Of the 207,191 cwts in April, Canada supplied 3,818 cwts, (usually about 9,000 cwts); Finland 21,229 cwts; Sweden, 66,591 cwts; Norway, 39,479 cwts; Germany, 42,947 cwts; Belgium 6,507 cwts; United States of America and other places, 26,600 cwts. The total supplies from Canada for four months are 28,567 cwts, compared with 7,359 cwts for the corresponding period in 1921.

This branch of Canada's industry is progressing in the United Kingdom imports. There is still, however, considerable room for improvement and the market wants some studying, as Finland's and Germany's figures can show.

Wages and Hours

One of the new clauses in the agreement between millowners and workers, which is not yet ratified, states that in 3-shift mills working week to be 132 hours, or 44 hours per person; extra time 4 hours at time and a quarter pay and further two hours at time and a half pay. In exceptional cases any mill can be run an additional number of hours extra after the consent of the Federation and Unions, such hours to be paid at the overtime rate mentioned above.

The scale of wages are roughly about as follows, but, of course, not yet agreed to:— papermakers on shift, class I, 36 cents an hour. Papercoating, Class I, on shift 32 cents; class I, day work 28½ cents. Papermaking and paper coating: Class 2 on shift 30 cents; on day 26½ cents; class 3, on shift 27 cents; on day 23¼ cents. These are the rates with the cost of living at 85 (in March it was 86 p.c. in Feby. 88 p.c. Jany 92 p.c.), but in April the cost did not become reduced. However, for every 15 points fall in the cost of living the minimum rates of pay also did not become reduced.

PULP AND PAPER NEWS

Miss Winifred King, who has been for some time past steenographer for the Ontario Pulp and Paper Maker's Safety Association, and recently doing in addition special work in the Toronto Office of the Pulp and Paper Magazine, was the recipient, on Saturday last, of a silver service on the occasion of her leaving to be married. The presentation was made jointly by Mr. A. P. Costigane, Secretary of the Safety Association and Mr. H. W. Thompson on behalf of the Inustrial and Educational Publishing Company.

Mr. Geo. Challes of Riordon's Ltd. who has been indisposed for two or three weeks is feeling better following a short stay at Mr. Carl Riordon's place at Cache Lake. He will be one of the Canadian guests at the picnic of the Miami Valley Mills this week.

Mr. John W. Brassington, chief engineer of the Pulp and Paper Division of the Port Arthur Shipbuilding Co. sailed for England on a business trip.

The annual convention of the National Lime Association will be held June 14-16, Hotel Statler, Cleveland, Ohio. The activities of this convention will deal with the technology of the uses of lime and the industrial problems of manufacturing and marketing lime. Several papers dealing with the use of lime in the Pulp and Paper Industry have been arranged for.

KILLED IN PAPER MILL

A fatality occurred at the plant of the Brompton Pulp and Paper Co., May 31, when Arthur Chapdelaine, a resident of East Angus, while working in the card board room, lost his balance and fell into a tank known as the chest. Other employees immediately went to his assistance but he was dead.

COLBALT PAPER SOLD

North Bay, Ont., June 2.—Plans which have been under way for some time have culminated in the transfer of the Daily Nugget Newspaper and Job Printing plant to a new company, the Browning Press Limited, with an authorized capital of $100,000. The new company succeeds the Cobalt Daily Nugget Limited.

H. S. Browning, who has been connected with the Nugget since 1908, is at the head of the new firm, as he was of the old. Improvement and enlargment of the paper is planned to meet the requirements of the Northern Ontario field.

BODY OF PULP WORKER FOUND

The drowned bodies of an unknown man and a dog, the latter tied up in a sack, were found in the St. Lawrence river opposite St. Vincent de Paul, and within a few feet of one another last week.

The unknown man had apparently been in the water less than a month. He was about five feet four inches in height, weighed between 125 and 130 lbs, wore black overalls, grey shirt, black boots and socks, and a green coat. In a pocket was a pocket book with a paper bearing several Montreal addresses. On his finger was a ring with the initials F. B. on it. In the lapel of his coat was a badge bearing the words, "Pulp, Sulphite and Paper Mill Workers."

Coroner McMahon will hold an inquest as soon as body is identified.

Any information should be sent at once to Coroner McMahon, Montreal.

ARABOL CANADIAN OFFICE TO BE IN TORONTO

The Arabol Manufacturing Company, which has recently been incorporated as a Canadian firm with past senographer for the Ontario Pulp and Paper general Canadian Sales Office. This will be in the new suite occupied by Paper Sales, Limited, in the Colonial Building, 13 King Street West, which firm has for some time been acting as sales agents for the well known Arabol lines of gums and pastes.

PAPER SALES LIMITED, MAKES A MOVE.

Among the Spring fovers is the firm of Paper Sales Limited, Toronto. This firm is now at the Colonial Building, 13 King Street West. We are advised that they have taken over the sales of the Specialty Paper Company, Limited of Camden East, which concern has given up the manufacture of Kraft wrappings and will now focus on the production of M. F. book papers.

RETURNS FROM EUROPE

Mr. John Martin of the John Martin Paper Company Limited, Winnipeg, passed through Toronto on his return from a trip through the United Kingdom and parts of Europe. When seen by the Pulp and Paper Magazine Mr. Martin promised to let us have shortly, a brief resume of his impressions of the trip. Mr. Martin is an advocate of education in industry as a preparation for leadership and it is expected that Mr. "Jimmy" Martin will soon commence preparation for business by taking on a practical course in one of the mills, from the ground up.

SPANISH RIVER SURVEYING BY PLANE

A large six-passenger hydroplane has been shipped from Dayton, Ohio, by the Dayton-Wright Company to the plant of the Spanish River Pulp and Paper Mills, Ltd. The plane is to be used in connection with a surveying project in the company's extensive timber preserves lying between territory adjacent to Sault Ste. Marie and the Hudson Bay. Negotiations for use of the plane were conducted by George H. Mead of Dayton, who is identified with the affairs of the Spanish River Company. The Dayton-Wright Company will be paid by the square-mile unit for use of the machine. The plane is said to be able to make the distance between the Soo and Moose Station on Hudson Bay in three hours. The aerial survey will involve a modern and expert photographic service. Photographs of the section to be surveyed will be taken piecemeal. At least a year may be required to complete the work. Although this unusual survey will entail costs for the innovations called into use, it is estimated that the total outlay will be much less than with the old method of employing timber cruisers.

He who plants a tree lightens the burdens of his fellowmen. He who plants a tree erects to himself a living monument and makes bold an attempt to leave the world more beautiful than he found it.

Technical Section

REVIEW OF RECENT LITERATURE

A-Properties and Analysis of Raw Materials and Finished Products

A-3 F-5 Fractional Boiling of Esparto. J. EDINGTON AITKEN. **Pulp and Paper,** xix, 1260-1262, (Dec. 15, 1921). The non-cellulose constituents of esparto consist of (1) starches and similar compounds, (2) pectoses, and (3) lignins. The author proposes first boiling the grass for about one hour with a weak solution of caustic soda (1.5 per cent sodium hydroxide on the dry weight of the grass) either at or above atmospheric pressure, draining off the liquor, and boiling for about 3 hours at 35 to 40 pounds pressure (gauge) in liquor containing 14 per cent sodium hydroxide on the weight of the grass. The advantages claimed for this process are: (1) Early removal of the highly colored products of starch and pectose resolutions; (2) A much cleaner and more easily washed pulp; (3) Greater economy in bleach, a better color, and better permanence of color; (4) Reduction in cost of recovery. The only disadvantage is that the digester is more difficult to furnish. -A. P. -C.

A-3 R-5 The Manufacture of Straw Pulp and Paper in France. A. LE CHATELIER. **Papier,** xxiv, 547-548, (Dec. 1921); **Monit Papeterie Francaise,** 1ii, 781, (Dec. 15, 1921). The author suggests that the manufacture of straw pulp be undertaken on a small scale by the French farmers, as a co-operative undertaking. The process is well known and does not require any unduly expensive or complicated equipment. It would have the double advantage of giving the farmers an outlet for their straw and of reducing very considerably the importation of paper pulps into France. -A. P. -C.

A-4 A-5 Safeguarding Shipments of Pulp to Foreign Ports. C. R. HAZEN, Milton Hersey Co., Montreal. **Pulp and Paper,** xx, 68-70, (Jan. 26, 1922); **Paper Mill,** xlv, No. 9, 2, 42, 44, (March 11, 1922). The following recommendations are made, applicable to the case of hydraulic pressed pulp. The system of sampling and testing, preferably the wedge-system, should be explicitly detailed for the protection of the mill and the guidance of the tester. The proportion of bales to be taken should be stated more fully than has been done so that if there are several lots of pulp included in the shipment a proportional number shall be taken from each lot and the air dry weight of each estimated separately. The provision that only intact bales of normal weight should be taken for test should be rigidly enforced. The method of cutting the wedges and selecting the laps should be to cut them always to a template and to cut one wedge from the top layer of every fourth bale. The author recommends for discussion the establishment of a bureau for settling disputes, the bureau to nominate their expert and pay him. The bureau would consist of three men, one nominated by pulp and paper manufacturers, one by pulp buyers, and the third to be chosen by these two. -A. P. -C.

A-4 A-15 H-1 Determination of the "Bromine Figure" or "Chlorine Factor" of Pulp, and Utilization of these Quantities in Bleaching. ALFRED TINGLE, E.B. Eddy Co., Ltd., Hull, Que., Canada. **J. Ind. Eng. Chem.,** xiv, 40-42, (Jan. 1, 1922); **Paper,** xxix, No. 18, 7-10, (Jan. 4, 1922). The extent to which bromine solutions, approximately decinormal, act on cellulose and on unbleached sulphite spruce pulp has been investigated. It is found that accurate measurements are possible only when the material is brought into solution, e.g., by certain mineral acids, before treatment with bromine. Under these conditions there is no reaction between bromine and cellulose within 30 minutes. The reaction between bromine and pulp (containing ligin) seems to proceed in definite steps, one of which is completed in 30 minutes. The determination is carried out as follows. A decinormal bromine solution is prepared by adding 8 g. of bromine to 100cc. of normal sodium hydroxide solution, diluting to 1 liter, and standardizing by adding excess of potassium iodide, acidifying with hydrochloric acid, and titrating against decinormal sodium thiosulphate solution. The "acid solvent" is prepared by adding 50cc. of sulphuric acid (sp.gr. 1.84) to 450cc. of hydrochloric acid (sp. gr. 1.19) and allowing to cool. Sometimes the pulp is better dissolved by adding the acids separately and successively in the reaction vessel, allowing the hydrochloric acid to disintegrate the pulp before adding the sulphuric acid. A 0.6-0.75g. portion of the pulp is weighed into a 200-cc. flask having a well ground glass stopper. Add 30cc. of "acid solvent" and agitate till solution is complete (or add 27cc. hydrochloric acid, shake till the pulp is disintegrated, add 3 cc. of sulphuric acid, and shake again). To the uniform solution, free from hard, unchanged pulp, add 20 to 25 cc. of bromine solution, shake well, allow to stand for 30 minutes with occasional gentle agitation, add 2g. of potassium iodide dissolved in 25cc. of water, shake well, dilute as largely as the capacity of the reaction vessel allows, and titrate with decinormal thio-sulphate solution. The thiosulphate should be added very slowly towards the end and each addition should be followed by prolonged and very vigorous shaking. The end point is taken at the disappearance of the red tint of the cellulose precipitate, leaving a cream colored or white suspension. The results obtained on unbleached sulphite pulp have been calculated to what is called the "bromine figure", which is defined as the weight in grams of pulp which reacts with 1 cc. of decinormal bromine solution. A more convenient figure is the "chlorine factor" which is defined as the weight of chlorine equivalent to the bromine reacting with 100 parts of pulp in 30 minutes. In the case of the pulp experimented upon, it was found that the weight of chlorine required to bleach 100 pounds dry weight is equal to the chlorine factor multiplied by 3; and it is suggested that the factor 3 might vary from mill to mill according to the nature and quality of the pulp and the method of carrying out the bleaching. -A. P. -C.

A-11 Determining the Quality of Loading Materials for Paper. F. M. BOUVIER. **Monit. Papeterie Francaise,** liii, 13, (Jan. 1, 1922). To determine the quality of loading materials for paper making, the following determinations should be carried out: moisture (drying at 100 to 105 degrees C.), whiteness (working up with water and glycerin and comparing with a standard sample), fineness (noting the time of settling in water as compared with standard samples, or microscopically), grit (working up with water and passing through a 150 mesh screen), and chemical analysis. -A. P. -C.

A-14 The Analysis of Cardboard. Tensile Strength and Composition. RAYMOND ISNARD. **Papeterie,** xliv, 50-57, (Jan. 25, 1922). Isnard describes a homemade apparatus for testing the tensile strength, which may also be used to indicate the elongation if desired. It is not as accurate as the instruments at present on the market, but is sufficiently accurate for the purpose, and is cheap and simple. The microscopic determination of the composition may give either the nature of the fibers used, or else the nature and grade of the raw materials, the latter being much harder to determine and requiring considerable experience. The usual reagent used is chloro-iodide of zinc. -A. P. -C.

B-Forestry and Woods Management

B-2 Experiments in Forest Fertilizing in a Heath Plantation of Norway Spruce. LUDWIG. **Zeitschr. Forst- u. Jagdw.,** lii, 42-51, (1920); **Botan. Abs.,** ix, 27, (Aug. 1921). The preliminary results of an experiment established in 1914 in a 15-year old stand of Norway spruce show that the application of fertilizer neither stimulates growth nor suppresses heath. An acceleration of growth was noted only where the physical condition of the soil was improved simultaneously with the application of the fertilizer. -A. P. -C.

B-2 Uniformity in Sylviculture. MARTIN. **Tharander Forst. Jahrb.,** lxxii, 45-61, (1920); **Botan. Abs.,** ix, 28, (Aug. 1921). A comparative discussion of the methods of regeneration, both artificial and natural, used in Germany. The basic principles and objectives of many standard methods are given, and the actual results attained by each method are cited. Large-unit management, and small-unit management and even-aged and uneven-aged stands are compared. Some foresters favor uniformity within stands and difference between stands, while others prefer a mixed condition within stands. The author believes there is good in both principles, that unnecessary variety should be avoided, and that undue effort should not be put forth to attain uniformity in stands. -A. P. -C.

B-2 Natural Regeneration of Scotch Pine. BIEHLER. **Allg. Forst-u. Jagdzeit.,** xcvi, 2-15, (1920); **Botan. Abs.,** ix, 18, (Aug. 1921). Foresters generally believe that Scotch pine cannot be successfully regenerated by natural reproduction methods. The author, by citing numerous experiments and results therefrom, makes the claim that natural regeneration is not only possible, but also practicable and to be recommended from an economic standpoint. The two principal factors for success are soil condition and stand composition. -A. P. -C.

B-2 Increasing Wood Production without Increasing Forest Area. ARNDT. **Zeitschr. Forst-u. Jagdw.,** lii, 89-94, (1920); **Botan. Abs.,** ix, 18, (Aug. 1921). Compulsory co-operation of small woodland owners is recommended as a means of increasing wood production without increasing the area of forest land. -A. P. -C.

B-2 The American Walnut. J. S. ILLICK. **Am. Forestry,** xxvii, 699, (Nov. 1921). C. L.

B-3 Forest Fires - A National Problem. WALLACE HUTCHINSON. **Am. Forestry,** xxvii, 675, (Nov. 1921). A brief survey of the forestry situation in the United States, emphasizing the comparative need for adequate protection from forest fires. The forestry problem is national in scope because it has to do with a product of the land that is essential to all business development. The kernel of the whole forestry problem is fire-protection. If the idle forest land could be put to work growing trees, and fire kept out, they would produce all the timber that the country needs. Now, however, timber is being cut four or five times faster than it is being grown. -C. L.

B-9 Available Pulpwood in Canada. **Paper,** xxix, 30, (Oct. 5, 1921). A study of the pulpwood situation of Eastern Canada by the Dominion Commission of Conservaton gives a total estimate of 501,000,000 cords of spruce and balsam in the Eastern Provinces, of which about 306,000,000 are actually available and a further 38,000,000 will be made available if the Temiskaming and Northern Ontario Ry. is extended to Hudson's Bay. The total resources of Canada at the present time are estimated at 901,000,000 cords of coniferous pulpwood species; and there are also large amounts of poplar and Jack pine in all the Provinces, which are to a certain extent being used in the manufacture of certain papers. A. P. -C.

C—Wood preparing and equipment

C-4, D-3, E-3, F-3, K-3. Measuring Pulpwood and Paper, xxix, 22, (Sept. 14, 1921). Brief sketch of the method described in Bulletin 44 of the News Print Service Bureau for finding the amounts of pulp wood, lapped pulp, coal, lime, limestone, sulphur, and clay in piles of the respective materials. It consists essentially in finding the cubical contents of the pile and dividing by the number of cubic feet per ton, which value should be determined experimentally in each mill. -A. P. -C.

K-Paper Making Processes and Equipment

K-4 Billingham Waste Paper Recovery System. Paper, xxix, 16-18, (Oct. 12, 1921). U. S. patent No. 1, 384,987, July 19, 1921. Also, Can. patent No. 213, 090, (Aug. 23, 1921), claims allowed 16. After the sorted magazines are shredded they are conveyed to a blower where solid soda ash is added to the amount of 2.5 per cent. of the weight of the paper under treatment. The mass is then blown into a softening tank where dry China clay is added, subsequent to the addition of warm water sufficient for efficient pump operation. Being sufficiently softened at a temperature of 165 degrees F., the stock is pumped to the tank of a defibering machine. In this tank two streams of pulp are kept impinging on each other from seperate nozzles. Fifteen minutes of this treatment serve to loosen coloring matter, pigments, and ink vehicles. The charge is then pumped to washers in the beater room from which it passes through the usual routine processes to the book paper machine. -A. P. -C.

K-7 Chemical Hydration of Pulp. ALFRED Mac Kay, Meigs, Bassett & Slaughter, Inc., Philadelphia. **Paper,** xxix, No. 16, 7-10, (Dec. 21, 1921). Hydration of paper stock in the beater is a chemical change, the energy spent in operating the beater merely hastening chemical action. Experiments were carried out with a view to obtaining the hydration effects by chemical means in a much shorter time and with a smaller expenditure of power. The main difficulty in working with such a method is to control it so that excessive hydration does not take place, which would impair or destroy the paper making qualities of the stock. A satisfactory method of control of hydration was evolved, which consists in forming a colloidal solution of cellulose and determining its viscosity, which is a measure of the hydration (details of the method not given). Tables are given showing the results of tests on the chemical hydration of various fibrous materials (second cut cotton linters, hull fiber, sulphite and linters, old thirds and blues, No. 1 new white shirting, No. 1 new linen). The following results were obtained as compared with untreated stock: no reduction in good paper making qualities with any grade of stock; increase in strength of finished sheet; decrease in beating time; stock that will mix in all proportions with sulphite and soda pulps; improv-

Continued on page 484.)

UNITED STATES NOTES

Because of prohibitive duties, paper bags cannot be profitably imported into Brazil. This information is contained in a recent report of the foreign trade bureau of the Commerce Department. As is usual in Latin American countries, only the high-grade stores use paper bags of the type used in the United States. The small stores make a practice of wrapping sugar, flour and similar products in plain paper.

A stroke of lightning started a fire in the plant of the Atlantic Paper and Pulp Company at Savannah, Ga., destroying a shed and storage building and causing a damage estimated at more than $50,000. Although the main building was saved, the mill will be forced to close down for a time.

Director Louis A. Hill of the Government Bureau of Engraving and Printing, in a reply to charges made by the plate printers' union that the quality of bond and currency paper now contracted for by the bureau "is impossible," says that better paper will be furnished for plate printing as soon as possible. A paper half linen and half cotton is now being used and Mr. Hill states that recommendations for the next fiscal year's contract call for 75 per cent linen and 25 per cent cotton. For the succeeding year it is hoped the Government could count on getting back to all linen paper. During the war, on account of the great pressure on the mills and lack of raw supplies, it was necessary to use all cotton paper. Much of the linen was made from flax supplied from Russia, a supply which has been seriously curtailed.

William Rothschild and J. Friedman have incorporated to carry on a paper merchandising business in San Francisco under the style of the Atlas Paper Company. The new concern will be an expansion of the establishment of Mr. Friedman who has been conducting a paper jobbing house in San Francisco for the past twenty years. William Rothschild, his new partner, was formerly with the San Francisco Division of the Zollerbach Paper Company.

The Paper Trade Association of Philadelphia, at its recent annual meeting, elected Arthur B. Sherrill of Riegel and Co., president for the ensuing year. Mr. Sherrill, who for years served the organization as chairman of its nomination committee, was chosen unanimously when nominations were made from the floor after he had twice declined to accept the committee's nomination. When he saw that his choice was being demanded, Mr. Sherrill accepted. He is immensely popular with the Philadelphia trade, and that he was not previously selected for this honor was due to his having headed the nominations committee of the association until this year. Other officers elected were: Harry F. Donahue of the Molten Paper Company, vice-president; Norbert A. Considine of the Paper House of Pennsylvania, secretary, and Harvey E. Platt of the J. L. Smythe Company, treasurer.

At a meeting recently in Augusta, Maine, before an examiner for the Interstate Commerce Commission, promoters of the proposed Eastern Maine Railroad outlined the plans and purposes of the new transportation project. They pointed out that the new road will open up a section of the state rich in long lumber and pulpwood. The road will run a distance of 128 miles between Bangor and Houlton, traversing a thickly wooded country which has not been cut as extensively as other localities in Maine because driving streams are scarce in the section. Permission was asked at the meeting for construction of a line between Mattawamkeag and Bancroft by the Mattawamkeag and Eastern Railroad Company, which is affiliated with the Eastern Maine corporation. Securities asked for the two roads are approximately $3,500,000.

T. H. Hammond, formerly superintendent of the Taggarts Brothers Company mill at Watertown, N.Y., is engaged in the organization of a paper making plant to be operated at Wellsburg, W. Va. He is at present busy with the financing of the proposition. Merritt J. Davis has resigned as secretary and treasurer of the Watertown Stone Products Company, Inc. to become associated with Mr. Hammond in the development of the Wellsburg project. He has left Watertown permanently and is now assisting in the preliminary plans at Wellsburg.

E. W. Elsworth of Watertown, James A. Murray of Potsdam, N.Y. and A. H. Kennedy of Kingston, Ontario, have pooled their interests in the handling of pulpwood. All three are well known to the industry in Northern New York and Canada. Mr. Elsworth has been doing business supplying Canadian timber to Watertown mills during the last seven years. He was previously associated with the Remington group of mills. He will have charge of the office work for the new combination, and will visit the mills and woodlands located in Quebec when the need arises. Mr. Kennedy, a former minister who turned to the woodland activities when poor health forced him to give up his profession, will look after the shipping department of the new partnership. He is familiar with the timber lands of Ontario and has a wide acquaintance with wood shippers. Mr. Murray is thoroughly familiar with the pulpwood and paper business, having been connected with the A. Sherman Lumber Company for twenty years.

SALESMEN'S OUTING

The New England Division of the Salesmen's Association of the Paper Industry will assemble at Copley Plaza Hotel, Boston, Mass., at 10.00 A. M. Friday, June 9th, when start will be made for Scituate, Mass., going via the famous Jerusalem Road, which runs along the coast where there are many attractive summer homes. On through the old town of Cohasset, thence to Egypt where the famous Lawson estate "Dreamwold" is, which should be in a blaze of red ramblers.

After luncheon at the Scituate Country Club, the golf enthusiasts will have an opportunity of trying the course there which is said to be very sporty. Leaving Scituate around 5.00 o'clock the party will moter on to the old historic town of Plymouth which has just passed its Tercentenary celebration. An hour or more can be spent very pleasantly here. Dinner will be served at 7.30, after which the party returns to Boston over the road, and if the weather is favorable as it should be, it ought to be an attractive ride in the full of the moon.

President Howard Reynolds, in O. K.-ing this program, said: "No salesman either from New England or outside would miss this meeting if he had once attended a New England Outing."

PULP AND PAPER STATISTICS

The Department of Trade and Commerce has issued statistics for the imports and exports of various commodities for the fiscal years ending March 31st, 1914, 1921 and 1922. This enables us to make comparison between the year just closed and the last pre-war year, is the statement made in a special bulletin of the Canadian Pulp and Paper Association.

Details relating to the Pulp and Paper Industry are shown in the following items:

Imports into Canada

	1914	1921	1922
Cardboard	$ 324,133	1,697,548	842,193
Printing Paper, lbs	19,366,757	7,967,171	5,268,039
Printing Paper	$ 815,990	1,039,938	478,680
Wrapping Paper, lbs	6,980,626	6,353,648	3,862,629
Wrapping Paper	$ 214,498	695,218	243,567
& Stationery	$ 451,873	466,494	385,579
Other Paper	$ 3,517,772	4,219,701	2,459,298
Paper Boxes & Containers	$ —	1,473,436	803,075
Other Manufactures of Paper	2,587,468	4,044,064	2,725,213
Total Value	$7,911,734	$13,633,399	$7,937,605

The figures show that the value of these imports which increased greatly in 1921, decreased in 1922 to little above the figures for 1914. As regards quantity, Canada imported much less paper in 1922 than in the pre-war year; this will be seen from the figures on printing and wrapping paper where quantities have decreased very considerably but values have not declined in anything like the same proportions.

Exports from Canada

Under the heading of exports we have the following figures:

	1914	1921	1922
Wall Paper Rolls,	550,433	5,108,287	2,359,284
	$ 45,328	831,771	445,536
Printing Paper, Cwts.	5,851,579	15,112,586	15,138,327
	$11,386,845	78,922,137	64,635,627
Paper Board	$ —	5,267,842	2,306,525
Wrapping Paper, Cwts.	182,520	340,946	162,625
	$ 615,310	3,672,780	1,264,654
Other Paper and Manufacturers of	$ 627,553	3,408,776	881,076
Total Value	$12,675,036	92,103,306	69,533,418
Pulp Wood, Cords	1,089,384	1,615,467	825,967
	$ 7,388,770	21,513,594	9,879,150
Chemical Pulp, Cwts.	1,515,633	9,080,964	7,098,527
	$ 2,923,083	55,060,219	25,468,785
Mechan. Pulp, Cwts.	4,816,170	5,282,042	5,336,710
	$ 3,441,741	16,491,818	10,456,092

The tremendous advances in the value of our exports in 1921 was of course partly due to the increase in prices, but it is satisfactory to note that where quantities are given in the Government figures these show up well in comparison. The quantity of wall paper exported in the fiscal year just closed was over four times the quantity in 1914; printing paper exports increased from 5,851,579 cwts. to 15,138,327 cwts.; wrapping paper did not do as well, showing a decline from 1914 figures.

A similar large increase over 1914 figures is noted in the quantity of chemical pulp exported in 1922 and a smaller increase in mechanical pulp. Considering that the figures for the fiscal year 1922 includes nine months of 1921, which was a year of depression and slackness, there seems good evidence that the pulp and paper industry of Canada stood the shock very well and that it is progressing in the right direction.

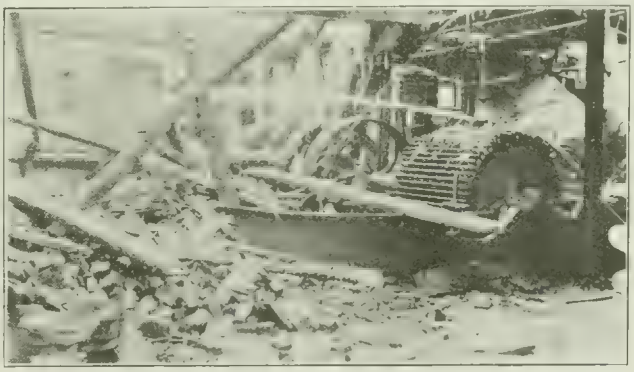
DON VALLEY PAPER MILLS HAS $100,000 FIRE

Fire, which was first discovered at about six o'clock in the morning of June 1st, caused damage to the Don Valley Paper Mills Ltd. of Toronto, estimated roughly at $100,000.

The fire started in a stock house at the Northwest corner of the mill and completely destroyed two large stock rooms, with a quantity of pulp and white paper cuttings. The boiler house, machine shop, rag boiler and beater rooms were gutted, though possibly the boilers and one or two of the beaters may be salvaged.

The Main Stock Room, That Was

The fire is believed to have been the result of boys smoking in the old stock room, which is seldom visited. It had quite a headway when discovered. The fire appliances and crew of the mill did good work, but the city apparatus was delayed on account of the mill being outside city limits.



The Hose is Still Playing in the Beater Room

The new machine room, completed last year, and the finishing departments were not damaged.

Reconstruction work is already underway and Superintendent Gain expressed the hope that the mill will be able to resume production in little more than a month.

Our sincere sympathy is extended to the Company.

The former government ordnance plant at Nitro, W. Va., including 91[illegible] acres and a power plant, has been purchased by the Charleston Paper Manufacturing Company. According to an announcement made by the company's management, $100,000 will be expended in getting the plant into shape for contemplated operation. A heavy grade of wrapping paper will be the principal product. A force of 100 men will be employed at the start.

(Continued from page 481)

ed physical properties of the finished sheet (including perfect sheet formation and reduction in the amount of size required); a stock that will reach a certain degree of slowness and result in a longer fiber with better felting qualities, which produces a stronger sheet; a reduction in caustic, time of digestion, amount and time required for bleaching with every grade of stock. -A.P.-C.

K-4 De-Inking of Waste Newspapers. Z. angew. Chem. xxxiv, 558, (1921); **Rev. Prod. Chim.**, xxv, 22, (Jan. 15, 1922). The author recalls that in 1903 the German chemist Otto N. Witt published an article on the de-inking of old newspapers, in which he recommended the use of aniline dyes for printing newspapers and other publications having but a transient interest. These inks would be of the same nature as those used for typewriter ribbons, stamping pads, etc., and a mere bleaching would be sufficient to recover the fibers. -A. P. -C.

K-4 De-Inking of Waste Newspapers. Loffl. Chem., Zeitg., xlv, 286, (1921); **Rev. Prod. Chim.**, xxv, 22, (Jan. 15, 1922). According to the author attempts to separate printing ink from the pulp in waste papers have so far given negative results. To the reasons given by Haas (**Chem. Ztg.**, xlv, 913, 1921) he adds the following: (1) owing to their rough surface the particles of lamp black adhere to the fibers; (2) the liberation of the particles can be obtained only by the use of a large excess of reagents; (3) repeated washing causes considerable loss of short fibers; (4) a considerable proportion of old newspapers are used as such for household purposes. If a method were found for recovering the cellulose from the waste newspapers, the difference in price between the recovered paper and new paper would be so small that the collection of waste paper would be dropped as being too little profitable. But as the problem has a great economic significance attempts should be made to find a printing ink which can be easily destroyed by some reagent. Linseed oil, tar, and its distillation products should also be replaced by products more easily separated from the pulp. -A. P. -C.

K-4 De-Inking of Waste Papers. W. SCHRAUTH. **Chem. Ztg.**, xlv, 1090-1091, (1921); **Rev. Prod. Chim.**, xxv, 22, (Jan. 15, 1921). A reply to Loffl and Haas (see preceding abstract). The author claims that the use of aniline colors instead of lamp black in the manufacture of printers' ink could not be successfully carried out, as their use could not be made compulsory by law. Lamp black inks are too firmly established to be supplanted. The fact that de-inking is difficult does not mean that there is no solution to the problem. The solution must be found by scientific research. Spring's work has shown that lamp black is strongly adsorbed by soap, in the presence of which it readily passes through filter paper. The most suitable soap solution must be determined by further research. For the removal of the vehicle, the solvent should be added in the form of emulsion, which penetrates better into the interstices between the fibers. -A. P. -C.

K-7 K-12 Paper Mill Equipment: Beaters and Paper Machines. E. ARNOULD. **Papier**, xxv, 30-33, (Jan. 1922). Brief and general discussion of various details in the design of beaters and paper machines. -A. P. -C.

K-7 Calculation of the Power Requirement of Beaters. F. M. BOUVIER. **Monit. Papeterie Francaise**, lii, 788-790, (Dec. 15, 1921); Translation by A. Papineau-Couture in **Paper Trade J.**, lxxiv, No. 13, 45-47, (March 30, 1922). The power supplied to a beater is entirely used up in (1) raising the stock to the height of the backfall (W_1), (2) triturating the fibers (W_2), (3) circulating the stock (W_3), (4) friction between the shaft and bearings (W_4). The following formulas are worked out: $\mathbf{W_1 = 0.222.A.B.U.H}$, in which **A** is the width of the trough in meters, **B** the height of stock in front of the roll, in meters, **U** the velocity of circulation of the stock in meters per minute, **H** the height of the backfall in meters. $\mathbf{W_2 = 0.0007.p.S.f.D.n}$, in which **p** is the pressure of the roll against the bedplate, in kilos per sq. cm., **S** the area of contact of the roll and bedplate in sq.cm., **f** the coefficient of friction between the roll and bedplate, **D** the diameter of the roll, **n** the number of revolutions per minute of the cylinder. $\mathbf{W_3 = 1.35.A.B.v_0\ (v^2\text{-}v_{02})}$, in which **A** and **B** have the same meaning as above, **v** is the velocity of the stock as it leaves the roll, $\mathbf{v_0}$ the velocity of the stock in the trough, both expresed in meters per second. For a given value of **v**, $\mathbf{W_3}$ is a minimum when $\mathbf{v_0} = \frac{v\sqrt{3}}{3}$. $\mathbf{W_4} = \frac{T\mu d\pi n}{60x75}$, in which **T** is the total load on a bearing, **d** the diameter of the shaft in meters, μ the coefficient of friction, which can be taken equal to 0.02 or 0.03. W_1, W_2, W_3, W_4 are all given in h.p. It is shown that the greater the density of the stock the less the value of $\mathbf{W_3}$. -A. P. -C.

K-7 Improvement to Defibering Engines. Fr. Patent No. 523,872, V. BERNOT and RAYMOND FOURNIER. **Papier**, xxiv, 503, (Nov. 1921). The improvement consists in placing a rotary cylindrical screen back of the roll of a beater, the mesh of which is chosen so that the fibers which have been completely separated from one another are allowed to go through while bundles of fibers are held back and remain in the beater. Material is continually fed to the beater to replace that which is removed through the screen. The advantages claimed are: (1) the fibers are subjected to the action of the engine only so long as they are in bundles, (2) the separated fibers are continually removed as soon as they are separated, (3) the material is fed to the apparatus regularly and continuously, (4) the separated fibers remain but a very short time in the apparatus and they are therefore hydrolyzed to a minimum extent. The process is applicable to beating as well as to defibering. -A. P. -C.

Note: This seems very similar to the Bird Beater Attachment.—Editor.

K-7 Beater Room Hazards. CHARLES WALKER, Employment Manager, Eastern Mfg. Co., Bangor, Me. **Paper**, xxix, 9-10, (Oct. 12, 1921); **Paper Trade J.**, lxxiii, 46, (Oct. 6, 1921). Present day beating engines are very nearly fool proof, so that except when a beater roll is being removed by the repair crew there is little danger of a man being killed or eriously injured. But there are always minor dangers present in the beater room. These are pointed out and hints are given on their elimination. -A. P. -C.

K-8 Dyeing and Tinting of Paper. J. MERRITT MATTHEWS. **Paper**, xxix, 21, (Sept. 28, 1921). Description of the dyes used and methods of applying them. A. P. C. -

K-10 Sizing Paper with Paraffin. Fr. Patent No. 524, 574, C. A. E. POULAT, May 16, 1921. **Papier**, xxiv, 543, (Dec. 1921). One hundred parts of kaolin are worked up with 20 parts of hot paraffin, and allowed to cool while still working the mixture. When almost cold, water is added in a fine jet, sufficient being added to form a homogeneous plastic mass. It is then diluted with water to a volume of 500 and is added to 500 parts of bleached chemical pulp at a consistency of about 3 per cent. The paper thus obtained is sized and is entirely different from what is generally known as "paraffined paper". -A. P. -C.

K-10 Processes for Sizing Paper. Papeterie, xliii, 1022-1025, (Nov. 25, 1921). A brief description of various methods of sizing: rosin, gelatin, casein, wax, stearin, fat or paraffin, sodium aluminate, waterglass, sulphite waste liquor, and viscose sizing. -A. P. -C.

K-12 The Paper Machine Table. Felting of the Fibers. M. F. VENNEMAN. **Monit. Papeterie Belge,** i, No. 2, 1, 3, 5, (Nov. 1921). The making of the sheet of paper on the machine depends practically entirely on the wet end; and yet since the invention of the paper machine there has been no fundamental change in this part of the machine. The removal of the water is still effected by natural drainage of the water through the wire, action of the table rolls, and suction at the boxes (or rolls). The continual increase in speed and width of the machines has necessitated a corresponding increase in the length and weight of the table so as to give the same amount of draining before the couch roll. This has influenced the shake of the machine, which in turn has affected the felting of the fibers. The fibers are felted especially at the moment when the direction of motion of the table changes, and hence the sharper the changes the better the felting action. With a relatively light machine the shake can still be made to act in this manner; but with modern monster machines it is questionable if such is the case. A new method of felting the fibers has recently been tried out, namely, jets of air which are given a rapid to and fro motion and which strike the stock just as it leaves the slice. It has been shown that this does not cause the formation of permanent air bubbles in the sheet, and that it has a decided effect in helping the draining of the water from the sheet. -A. P. -C.

K-12 Problems Encountered in the Development of the Laurentide News Print Machines. GEORGE D. KILBERRY. **Paper,** xxix, 15-18, (Sept. 28, 1921). A fairly detailed description of the two news print machines recently installed at the Laurentide Co.'s mill at Grand 'Mere, Quebec, by the Dominion Engineering Works, Montreal, which are designed to and have, run at 1,000 ft. a minute. -A. P. -C.

K-12 Production Chart for News Print. GERARD H. LAFONTAINE, Brompton Pulp and Paper Co., Ltd. **Pulp and Paper,** xix, 1097, (Oct. 27, 1921). A chart is given which was made out as a time saver for the cost department, which can show at a glance the ideal production of the machine. It is based on the equation P = K x S xB xT, where **P** is the production in tons per hour, **K** a constant which varies with the standard size of the sheet and the number of sheets to the ream,**S** the speed in feet per hour, **B** the basis weight in pounds, and **T** the trim in feet. -A. P. -C.

K-0 Paper Standardization. Paper, xxix, 9-10, 30, (Sept. 7, 1921). Program of work submitted at the preliminary conference held at the Paper Section of the Bureau of Standards, Aug. 30, 1921, stating the purpose of standardization, procedure to be followed, reference data available, classificaton of papers, definitions and nomenclature, simplification of sizes and qualities, specifications of quality, test methods and sampling, tolerances, revision of specifications. -A. P. -C.

N—Power generating

N-4 Improving the Performance of Steam Boilers. R. DE KERGARADEC. **Technique Molerne,** xiv, 14-21, (Jan. 1922). A discussion, largely mathematical, of chimney losses in boilers and of the methods of reducing them to a minumum, with special emphasis on the use of air preheaters, either with or without economizers. The advantages of the air heater are that it fills the same purpose as the economizer by recovering waste heat; it is lighter, cheaper, less cumbersome than the economizer and is not under pressure; the furnace can be supplied with hot air resulting in higher temperature, better combustion, and possibility of using poorer grade fuel -A. P. -C.

P—Safety engineering and welfare

P-2 Spreading Safety Ideas by Photography. A. ELLIS FRAMPTON, Hammermill Paper Co., Erie, Pa. **Paper,** xxix, 9-12, (Oct. 5, 1921). A description of the many uses to which the camera can be put to aid safety ideas in the mill. -A. P. -C.

P-3 Industrial Welfare Work in the British Paper Mills. Pulp and Paper, xix, 999-1001, (Sept. 29, 1921). Brief and general outline of what is being done in some of the British paper mills to cement the good feeling between employers and workers. -A. P. -C.

Q—Planning and construction

Q-2 Paper Mill Engineering. WILLIAM F. THIELE, Superintendent, Consolidated Water Power and Paper Co., Grand Rapids, Wis. **Paper,** xxix, 14-16, (Sept. 7, 1921). An outline of the functions of the civil engineer, steam engineer, chemical engineer, and maintenance engineer in the paper mill. -A. P. -C.

R—General

R-1 Notes on the Paper Industry of Czecho-Slovakia, Esthonia, and Findland. Paper, xxix, 24-25, 30, (Sept. 14, 1921). -A. P. -C.

R-1 American Paper Making Through French Eyes. PAUL JOUANNEAU. **Paper,** xxix, 23-25, (Oct. 5, 1921); **Pulp and Paper,** xix, 1021-1023, (Oct. 6, 1921). Also, **Papier,** xxiv, 529-531, (Dec. 1921). Impressions of Jouanneau's tour of Canadian and American paper mills, comparing paper making practice on this continent with that in France. -A. P. -C.

R-2 Books for a Paper Mill Library. Paper, xxix, 17-18, (Sept. 14, 1921). A short list of books and pamphlets (English, French, and German) useful for study or reference purposes by paper mill technologists. -A.-P. -C.

R-7 Relations of Managers to Employees. ROY G. MURBACH, The Gardner-Harvey Paper Co., Middletown, O. **Paper,** xxix, 19-20, 33, (Sept. 28, 1921); **Paper Industry,** iii, 1118-1120, (Nov. 1921). Outline of the psycology of handling men to get the best out of them A. P. -C.

R-12 Necessity of Cost Keeping. EDWARD N. HURLEY. **American Magazine; Pulp and Paper,** xix, 1023-1024, (Oct. 6, 1921). Out of 250,000 corporations that reported to the Federal Trade Commission, 100,000 showed no net income at all, 90,000 earned less than $5,000 and only 60,000 over $5,000. One-half of the people doing business in the United States have no cost books, 40 per cent. have some rough way of estimating costs, and the remaining 10 per cent actually know what it is costing them to do business. Examples are given showing how poor cost systems can be even worse than none at all, while a proper analysis of costs furnishes valuable data for fixing the sales policy of an organization. A. P. -C.

R-12 Uniform Mill Cost System. C. OLIVER WELLINGTON. **Paper,** xxix, 13-15, (Oct. 12, 1921); **Paper Trade J.,** lxxiii, 17-18, (Oct. 13, 1921). A discussion of the requirements and advantages of a uniform cost system for the pulp and paper industry. -A. P. -C.

R-12 Idle Time as a Manufacturing Loss. H. A. WINGATE, Assistant Secretary, C. H. Dexter & Son, Inc., Windsor Locks, Conn. **Paper,** xxix, 11-12, (Oct. 12, 1921); **Paper Trade J.,** lxxiii, 19-20, (Oct. 13, 1921). Brief outline of the problems of cost finding in the pulp and paper industry, especially of the manner of charging up loss due to idle time. -A. P. -C.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, June 6.—While the paper business in Montreal has not varied to any extent during the week, it has picked up the province,—"there is a gradual improvement," as one jobber put it. In Montreal trade is inclined to be spotty — it is not good, neither can it be called bad. There is a moderate turnover, with light stocks by jobbers and consumers, and a disinclination to order beyond what is immediately required. We must await a further development in general commerce before we can hope to see a pronounced revival in the paper trade as a whole. The budget proposals are not calculated to keep this advanced, but Mr. Fielding has to find the money and it is only natural that the industries affected should protest against fresh burdens.

The newsprint position is without material change. The orders in hand are sufficient to keep the mills well employed until the end of the year, with the prospect of further business coming to this side. Reports from the U. S. are optimistic as to an extension of trade, which will of course have its influence on the daily publishing industry, and in turn will mean a greater consumption of newsprint. The fact that additional machines have been ordered in this country is an indication that there is faith in the expansion of this section of the paper business.

The mills making fine and book papers report that they are running pretty nearly up to capacity. The local demand for these goods is satisfactory. Wrappings are not brisk. While tissues and toilets are inclined to be slow. The building boom has had a marked effect in roofing felts and sheathings, which are in active demand, not only in Montreal but also in Eastern Canada. Those commodities are mostly used in some houses, and the fact of the activity is evidence that most of the building now in progress is of the small class.

The demand for bleached sulphite continues good with prospect of a continuation of this condition. Other descriptions are quiet, although groundwood is firm in price.

American mills are still keeping out of the pulpwood market. One dealer states that "there is no price," the sales not being sufficient to establish any real basis of value. He asserted that the mills will find that available stocks will be small, and that there will be a tendency for prices to go up in the fall. It is reported that from $18.50 to $20. is asked for pulpwood delivered at Watertown.

Mr. H. J. Williams, manager of the export department of Harrisons and Crossfield, Limited, Montreal, has returned from a two months' business trip to England, where he visited many of the principal cities. He found conditions better than he expected, with a feeling of optimism existing. It is felt that the worst is over, and that there is prospect of a revival in trade. At the same time practically every industry is not running up to anything like capacity, the great problem being to reduce the cost of production.

The settlement of the textile dispute has relieved the industrial situation to a great extent. The mills in Manchester have, said Mr. Williams, a large number of orders for the East.

With regard to the paper industry, this had been affected by a dispute in the printing trade. The Continental countries are sending large quantities of paper into Great Britain — Norway and Sweden sending wrappings, printings, and writings, and Germany cheap writings. They are able to do this by reason of the favorable exchange. British mills are actually competing for foreign business in papers, and are quoting ridiculous prices, particularly for writings and high grade paper. The mills are shipping substantial orders for printings to Australia. One feature of the paper trade is the tendency for the mills to amalgamate, thus falling in line with other industries. As in Canada, railway rates are high, these exercising an unfavorable influence on business.

Mr. Williams added that his company intend to develop their Canadian trade on a more extensive scale. Through the head office in London and their connections in all parts of the world, the company is in daily touch with every market, and purchase goods in very large quantities. The firm imports raw materials and finished products from Great Britain and the Continent and exports finished goods in a large variety of lines to Australia, New Zealand, and the East.

Toronto Topics

Steady progress towards better business is evidenced in many lines. Rural trade reflects the very satisfactory soil and weather conditions, and gives indication of the bringing out of reserve resources in agricultural centres. Semi annual inventory taking, which is now becoming more customary, affects the June business from manufacturer to wholesaler and is indicated by quiet conditions in some lines.

Comment on sales taxes is not being heard much. Merchants generally seem to have assumed the position that it must be accepted but the odd fractions involved are objected to as adding considerably to the cost of clernical overheads. The quetion of cheque stamps is not so much under discussion pending an appeal to Ottawa to make a less onerous provision.

As yet there is little evidence of fall buying for retail trade. The bulk of business being done to-day is in small amounts for replacement. Until there is some heavier movement in fall buying there will be a sense of inactivity. Manufacturers are in a number of instances busy with material of a staple nature which will certainly be in demand, and there may soon be expected a little brightening in general lines, though it is conceded that real advance in business depends on returns from harvest, in so far as this part of Canada is concerned.

There is a marked tendency to firmness in pulp, especially sulphite. Several mills now report orders ahead and capacity production. Prices are unchanged.

GROUNDWOOD — around $30, delivered.

SULPHITE — news around $60, and book up to $65, bleached up to $90, delivered.

SULPHATE — $70.

BOOK and WRITING market remains quiet.

BRISTOL, COVERS and TAGS are somewhat brighter.

WRAPPING and BAGS are in fair demand — a feature of this market is that rural business is in better volume than urban.

WRAPPING —Kraft 9¾ to 10¾

BAGS — Light Kraft Less60-20-2½ in 100 m.lots

WASTE PAPER of practically every grade has been in good demand for the past week, and prices are ruling firm. Most of the mills appear to be freely seeking supplies, and some dealers claim to have refused to book orders ahead on account of the price.

No. 1 Books and Magazines advanced in price, and difficulty has been experienced in locating decent size tonnages of this grade. Shavings both Hard and Soft are moving freely, and packers are experiencing no difficulty in securing orders from mills. Mixed and Newspapers are moving along in the usual volume with no increases in prices.

New Cotton Cuttings are beginning to look a little brighter and better demand for #1 white shirts is noted, although prices remain unchanged. Old Cotton Rags are moving fairly well although some mills dealers report a reduction in buying price of roofing stock.

Scrap Bagging and Manilla Rope remain nominal, though some dealers report fair demand for manilla rope.

The new item of "#2 miscellaneous mixed" is stock packed by large department stores containing much foreign material such as strings, wood, and rags.

Paper Stock	
No. 1 Hard White Shavings	$3.75
No. 1 Soft White Shavings	3.25
Heavy Books and Magazines	1.70
Ledgers and Writings	1.95
No. 1 Kraft	2.25
Newspapers	.80
(Repacked) No. 1 Mixed Papers	12.00
#1 Miscellaneous Mixed	11.00
#2 Miscellaneous Mixed	9.50
Roofing Rags	20.00 per ton.
No. 1 White Shirt Cuttings	10 - 10¼
Fancy Shirt Cuttings	4¼ - 4½
Canton Flannels Bleached	7 - 7¼
White Lawns	6¾ - 7
Blue Overall Cuttings	5 - 5¼
Ropes and Bagging	
N. 1 Scrap Bagging	$17.50
No. 1 Manilla Rope	5 - 5¼
Mixed Strings	22.50

NEW YORK MARKETS

New York, June 3.—(Special Correspondence)—Activity in the paper industry continues of healthy character and of fairly broad dimensions. Demand for most kinds of paper is consistently expanding and the trade is gradually taking on a livelier air notwithstanding that the summer is drawing nigh and that usually at about this time of the year the market for paper slows down to an extent. Thus far there has not been any sign of the customary seasonal quietness, and there are many in the trade who look for paper business to hold up remarkably well during the next several months owing to small stocks in jobbers' and consumers' hands, which, it is believed, will keep buyers much in evidence throughout the summer. Prices on all descriptions of paper are steadying and in some instances show a tendency to strengthen. With raw material going up in cost, and with manufacturers finding a broader outlet for their paper, producers are more inclined to insist on firm prices and in certain cases to ask slightly higher figures.

That the paper industry is in a strong statistical position can be seen from the Federal Trade Commission's review of the United States paper manufacturing industry for April, just issued. This report shows that a total of 528,461 net tons of paper of all kinds was produced by U. S. mills in April, which although somewhat below the output in March when a new high record of paper production for more than a year was established, was nevertheless well above the average monthly output of 504,175 tons based on the Commission's reports covering the past five years. April paper production also was far in excess of the 422,012 tons produced in the same month a year ago, and, as probably best illustrating the marked improvement that has developed in recent months in the industry, was no less than 158,037 net tons above the 370,424 tons produced in July, 1921, when depression in the industry was at its worst and when manufacturing operations were at the lowest point at any time during last year. Moreover, the Commissions' latest report shows that mills are shipping out paper about as rapidly as it is made, and that not only are they readily marketing their current production but that they are disposing of some of their surplus holdings, as mill stocks of paper of all kinds decreased from 289,523 net tons at the beginning of April to 284,862 tons at the end of that month.

All reports relative to the newsprint market are bullish. Print paper is meeting with splendid demand and prices rule steady to firm, with considerable talk heard in the trade anent a possible advance in the autumn. There seems no question but that newspaper publishers are using as much paper at present as they have ever consumed, and that newsprint manufacturers are consequently getting just as much business as at anytime in the past, not even excepting the boom period following the late war, though it is distributed over more producing machines. Further, the present demand for newsprint is very healthy; practically all the supply being absorbed by publishers is going direct into consumption, thus giving the situation a most satisfyng complexion.

The International Paper Company has just restarted its No. 4 mill in Watertown, N. Y., which plant has been closed down for well over a year. This is an apt illustration of how active a demand exists for print paper. Reports from mill centres all over the country are to the effect that production is being increased and that manufacturers are shipping out newsprint regularly and in gradually mounting tonnage.

Fine papers are showing more life day by day. With business generally expanding, business houses are using more stationery because of increased correspondence, and also are sending out more circulars and other advertising matter, with the result consumption of bond and ledger paper is steadily increasing. Manufacturing costs of fine papers are on the rise, due largely to the advancing trend in rag stock and other raw materials and producers are frequently adjusting quotations on fine papers, most often in an upward direction.

Book papers are in better demand and seem destined to enjoy more favorable market conditions later in the year. It is quite apparent that advertising is increasing, and magazines and trade publications therefore find it necessary to print larger issues, so that consumption of book paper is slowly though surely getting back to nearer normal volume. Prices are still unsettled and some mills are selling book paper at non-profitable figures, but this situation will undoubtedly right itself as demand from consuming quarters becomes better.

Coarse papers are steady in price and are favored with a fair demand. Box boards are moving well although considerable complaint is registered by manufacturers over the prices obtaining. Plain chip board continues to sell in the New York market at between $32.50 and $35 a ton f.o.b. this city, and news board at $35 to $37.50

GROUND WOOD—There appears to be a little firmer undertone in ground wood quotations. No change of importance has occurred in market levels, but selling pressure has let down and producers seem more intent on receiving the prices asked than was the case recently. There are evidently two main reasons for this; first, because demand has increased to at least some extent during the past few days; second, because grinders are commencing to look forward to the summer when water conditions usually are unfavorable and when ground wood output is low, and are piling up reserve stocks to tide them over the hot and dry period. Average prices on domestic ground wood for prompt shipment range around $31 a ton f.o.b. pulp mlls. Sales are of course being made in some cases at less than this, but representative members of the trade say that the great bulk of pulp is bringing about this figure. Board mills have been fairly large buyers lately and newsprint manufacturers are absorbing supplies in regular fashion.

CHEMICAL PULP—Chemical wood pulp is moving in better tonnage and prices exhibit a hardening trend. Demand has not broadened sufficiently to have any advancing influence on values, yet reports invariably tell of papermakers buying in larger amounts, it being stated that pulp salesmen who are on the road visiting paper mills are sending back very gratifying orders. Bleached sulphite especially is said to be moving well, and at steady prices. Domestic and Canadian bleached sulphite of No. 1 quality is selling at 4.25 to 4.50 cents per pound at pulp mills, while foreign No. 1 bleached is readily bringing around 4 cents on the dock. Unbleached sulphite is in good demand, particularly those grades used chiefly by newsprint mills, while easy bleaching sulphite is under steady inquiry. Kraft is wanted in comparatively large quantities and quotations hold at around 2.65 cents ex dock for Scandinavian kraft, and from 2.75 cents upward a pound for No. 1 domestic kraft.

RAGS—Papermaking rags continue to display a firming tendency. Prices on most grades are gradually moving to higher levels, and the manner in which the rise is taking place indicates that it is healthy as the market is seeking a higher plane in a very gradual way. Dealers lay much stress on the limited amounts of rags available and say that supplies coming in from collection centres do not begin to measure up to normal, thus causing them to be rather bullishly inclined in respect to prices. Roofing rags have advanced a bit further this week. Sales of No. 1 domestic roofing stock to felt paper mills have been noted at around 95 cents a hundred pounds f.o.b. New York, and of No. 2 packing at better than 85 cents, while foreign dark cottons have easily brought 1.05 cents per pound ex the dock at this port. Old whites are strengthening in price, and new cuttings of most kinds also are on the uptrend. Thirds and blues are still the dullest grade of papermaking rags, and some dealers attribute this to the difficulty which writing paper manufacturers are having in bleachng out these rags properly at the present time.

PAPER STOCK—Old paper is in an active position and prices on nearly every grade are gradually moving

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upward. Certain kinds of waste paper are decidedly hard to locate in usual quantity, and dealers are making the best of this condition to ask higher prices in almost every sale. No. 1 soft white shavings have sold at 3.50 cents a pound f.o.b. New York, this being probably the strongest item in the market. Old No. 1 books and magazines are bringing 1.60 cents a pound f.o.b. this city, while one book paper mill Down East is said to be paying even better than this price. Old newspapers and mixed paper have advanced, the former now selling at 60 to 65 cents a hundred pounds at dealers' shipping points, and the latter at 47½ to 50 cents a hundred pounds. Old kraft paper is firm at around 1.75 cents per pound, white blank news cuttings at 1.70 cents, and No. 1 hard white shavings at 3. 75 cents per pound.

OLD ROPE AND BAGGING—Demand for old manila rope for papermaking purposes has not subsided and prices on this commodity are exceedingly firm. There has been talk of sales to mills up to 6 cents per pound at dealers' shipping points though indications are that more representative market levels are around 5.50 cts. Rope is far from plentiful, and demand is such as to prompt sellers to exact high prices. Old bagging, on the other hand, is little wanted by paper manufacturers, and prices, if anything, show a downward tendency. No. 1 scrap bagging is quoted at about 90 cents a hundred pounds, scrap gunny at about 1.10 cents, and roofing bagging at 65 to 70 cents a hundred pounds.

WOODLANDS SECTION SERIES

The Woodlands Section of the American Paper and Pulp Association is to be commended for the contents and appearance of number 1 of their series of papers publishing the proceedings of their annual meetings. The one just received covers the second annual meeting which was held in New York in April. The principal contents are as follows: Projects for 1922 - 23; A Permanent Cruise and Yield Study; What can a Forest Do for a Paper Company vs Contracted Woods Operations; Reforestation as Applicable to Private Timber Land Holdings; The Present Timber Supply; Sinkage; Intensive Local Fire Protection; Rossing at the Mill vs Rossing in the Woods; Labor Saving Machinery for Woods Operations. Copies of this publication can be had on application to the secretary at 18 East Street, New York City, for 50c each.

Two thousand years ago, the great apostle wrote "Behold what a great matter a little fire kindleth." Today, it gets the same little start and works the same big havoc. Have you any little fires on your conscience? — The Underwriter.

TIMBER SALE MAY KILL INDUSTRIES

Hollingsworth and Whitney Co., paper manufacturers in Maine, have bought over 300,000 acres of timber land in Nova Scotia and New Brunswick. The limits were owned by the Davidson Lumber Co. and C. T. White Ltd., and were sold through the Royal Trust Co. and the Quebec Savings and Trust Co. We understand the White interests were represented by the Quebec Savings and Trust Co. and this deal involved 125,000 acres, estimated to have over 1,000,000 cords of soft wood and 60,000, 000 feet of hard wood. The Davidson tract is larger and carries mostly soft food.

The newspaper dispatch from Halifax intimates that the new owners may erect pulp mills in Canada, but the Boston News Bureau says the wood will be taken to the Maine mills for manufacture. In view of the situation just referred, to the Bridgewater, N. S., Board of Trade passed the following resolution at a meeting held April 5th, 1922.

WHEREAS, The continued prosperity and progress of a country is based entirely upon a proper conservation of that country is based entirely upon a proper conservation of that country's natural resources, and

WHEREAS, In order that all classes of citizens may receive the greatest possible return from natural products exported, it is of the utmost importance that the manufacture of all such products shall be carried on to the greatest possible extent within the country before the goods are exported, and

WHEREAS, There is in Canada a large and increasing trade in the export of unmanufactured, immature timber, for conversion into pulp and paper abroad, resulting in our forests being rapidly denuded; and

WHEREAS, The future of this community in common with that of hundreds of others similarly situated throughout the country depends to a very large extent upon the continuation of the lumber industry, be it

THEREFORE RESOLVED, That in the opinion of this Board, legislation should be immediately passed entirely prohibiting the export from the country of timber in an unmanufactured state, and

FURTHER RESOLVED, That a copy of this resolution be forwarded to the Member of Parliament for this County with the request that the imperative need for such legislation be urged upon the Government, and

FURTHER RESOLVED, that copies of these resolution be mailedto other Boards of Trade throughout the Province of Nova Scotia urging that similar steps be taken by their respective bodies for safeguarding the future of the lumber industry.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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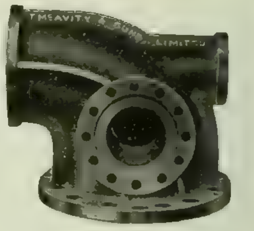

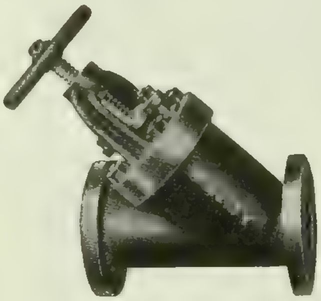

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:-: EDITORIAL :-:

LIVING ON SAMPLES

We heard the other day what at first seemed to be a very startling statement. The remark was that not more than 95 per cent of people know what they want. It seems astonishing to think that only 5 per cent of the individuals we meet and pass know what they want, know where they are going, and go about planning to arrive. But a little consideration of the cases of most of our acquaintances and even perhaps a little self-examination will go to show that most people are continually trying something new or different which they think or hope will be a little better than what they are at present engaged in. Some men are typical rolling stones; it is true they gather no moss but there is moss and moss. It may be worth while to stop long enough in a place to gather a little. It must be remembered too, that when a stone rolls it is generally downhill. People often do improve their position and their condition by moving but there are many, many cases where a man misses the big chance by premature dissatisfaction with the place where he is.

A certain amount of trial may be necessary to enable a person to know whether or not the circumstances of his employment will be congenial and lead to opportunities for advancement. Before changing, however, it is worth while to consider whether the road is really blocked and if it appears to be, to ascertain whether or not the individual is in his own way. A great deal is being done in these days to assist the young man in finding his niche before he really starts out in life. The opportunity for this study of business subjects and for manual training and for older boys the odd jobs or the regular work in mill, office, and store which is almost always available during summer vacations, furnishes a guide which if taken advantage of, will prevent many a misfit. Having spent a little time and serious consideration of available openings, even sometimes accepting employment temporarily in what may be even a distasteful position in order to await an opportunity to enter the work which one has chosen for a career, is time well spent. Then having made up one's mind as to the kind of work and the industry which furnishes the best opportunity for the development of one's particular talents, it is worth while to concentrate on making the most of the opportunities which such a position affords. Having become well established then in that position, the next step is to pick out a new objective and then, with the details and plans firmly in mind, to go after it. This generally requires in the first place, a careful survey of the field, then the discovery of the requirements, next the plan of action and finally the determined effort to push forward. This all requires courage, determination, and time but if the aim is true and the object is worthy it means development of character, and that is the biggest thing that any of us are called on to accomplish. Going about trying one job after another is drifting; it is living on samples, if we want a square meal either for our minds or our bodies or the full employment of our talents, we must follow a definite plan.

FOREST PERMITS

The burning question in Quebec just now is announcement that the Minister of Lands and Forests will require permits of persons desiring to enter the woods. There is no room for doubt that the enormous loss by fire which has already destroyed millions of dollars worth of timber at this early stage in the present season, is caused by the carelessness of campers prospecters, fishermen, hunters and others who travel through the woods during the dry season. For a number of years this province has demonstrated the feasibility and success of requiring permits before a settler or farmer is allowed to burn brush or slash. Is is too much to ask that the potential fire makers who periodically enter our forests, be required at least to register their intentions as to where, why, and for how long they are entering the woods? Each permit will of course, entail some clerical work and establishing permits might, and in fact should, require an increase in the force of rangers in order to keep proper track of the individuals. But a ridiculously small percentage of the annual fire loss would pay many times over the increased amount that should be spent on the protection of our greatest natural resource. We maintain that those in authority are not fully faithful to their trust so long as they leave untried any means which may properly be expected to decrease the serious national loss that occurs every year through the destruction of timber. No matter what the cost of the system of prevention, it is worth more than that to the people of this province and of the Dominion. By all means let the Government at Quebec as well as the Governments in all our forest provinces, take measures and enact legislation if necessary, to furnish more adequate protection to our forests than is at present provided.

We congratulate the Government on taking this step, and the Quebec Forest Protective Associations on the success of their propaganda.

Dont' miss the Summer Meeting of the Technical Section, Iroquois Falls, June 20-21.

UNFAIR FOREIGN COMPETITION

The proposal in the Budget introduced by Mr. Fielding to repeal the regulation affecting the importations from countries whose currency is depreciated has met with very strong criticism, on the ground that it will seriously affect Canadian industries. The paper trade is not touched to any extent by the general tariff changes proposed by the Government, but some sections of the industry are apprehensive of the effect of the clause wiping out the debased currency regulation. The manufacturers of kraft wrapping paper in particular are somewhat alarmed at the prospect of having to meet competition from countries — Germany for instance — where the depreciation in currency is favorable to the export of goods produced at very low prices, and where the wages paid are on a scale impossible on the North American continent.

Representations have been made to the Canadian Government as to the consequences which may follow should the proposal be passed. It is a matter of common knowledge that the demoralisation of the U. S. paper market last year, was brought about largely by the importations of European paper, which was able to be sold at prices which American and Canadian manufacturers could not meet owing to the difference in the values of exchange between Europe and America. Manufacturers in Canada and the United States were only able to hold the trade they did because of the protection afforded in the case of Canada by the law which it is now proposed to repeal, and in the case of the United States by the provisions in the Fordney Emergency tariff covering importations from countries with debased currency.

At the moment German competition is greatly minimised by the fact that the Berlin Government is maintaining an embargo on the exportation of certain grades of paper, but there is every reason to believe that this embargo will shortly be relaxed, if not abolished. Under such circumstances, the Canadian manufacturers fear that German paper manufacturers will endeavour to swamp this market with productions sold at prices with which Canadian and American manufacturers cannot compete and at the same time pay the wage rate prevalent on this side of the Atlantic.

The large amount of paper imported into this country—in the last fiscal year it totalled $8,737,000—indicates that Canadian mills are already subject to very keen competition, and it is felt that Mr. Fielding's proposal is only opening the door to further competition, and of a character which is unfair in that it is based on abnormal conditions which can be used to the great detriment of our manufacturers and their employees.—F. H. D.

No doubt the placing of British or Dutch values on German goods as provided in the revised budget will help matters.

COBWEBS

A mill in Quebec was recently required to pay $10,000 for an accident. A notice of this kind is read with discouraging frequency. We wonder what kind of a mathematician a manager is who figures that such an experience pays. Sometimes an accident is a result of deliberate neglect, disobedience, or carelessness on the part of the individual hurt, sometimes one man's injury is due to these characteristics on the part of a fellow employee and sometimes it is due to negligence, procrastination or penuriousness on the part of the management. In any case the cost of safe equipment, education of workmen and selection and oversight of the personnel, will pay for itself whatever it costs.

$10,000 for an accident: is it worth it?

Congratulations to E. B. Archibald, of Harland Engineering Co., who has obtained a contract of marriage with Miss Isabel Slack, of Montreal. We understand they are off on an electric drive—group, this time.

BLESSED BE THE MAN WITH A HOBBY

To be really interested in a hobby is to have a latch key to Eden, to the place where man worked for pleasure not for punishment.

The man with a hobby can slip away in a moment from the grind of doing what he must to the delight of doing what he likes.

A hobby is the greatest known mental and nervous safety valve. The man who possesses it has a treasure of infinite value to his health, and to his happiness- and to his business success.

It is a failing in modern life that we have too few hobbies; that we concentrate too much on business and replace recreation with distraction.

We have lost the fine art of enjoying ourselves.

Practically, it does not matter what a man's hobby is—collecting beetles or playing golf. If he enjoys it, he will go back to his business with a clearer view, a truer prospective, with greater enthusiasm.

But with the concentration of the age, many of us are apt to spoil our hobbies by making a business of them. We forget that we are engaged in our hobby solely and only to enjoy it, and we lose our pleasure in a passion to excel.

Hobbies should temper business: but it is quite possible to be intemperately temperate.

A hobby is an invaluable servant but a tyrannical master.

If you have no hobby, get one, it will save doctors bills. If you have a hobby, ride it, but don't let it run away with you.

P. S. Use some of your spare time learning more about your business.

SIMCOE COUNTY MUNICIPAL FOREST

Work was begun this spring in planting up the area in Vespra township, Simcoe county, Ontario, which the county council has acquired for a municipal forest. It will take several years to plant up the whole area of eight hundred acres, but the work will proceed year by year till it is done. It is possible that a nursery to grow part of the planting stock required will be started on the site.

A great many harsh things have been said about matches, but all the evidence goes to show that the careless users were really the guilty persons.—Deputy Fire Marshal G. F. Lewis, Ontario.

Concise Comments on Cost Keeping

by Thos. J. Burke, Secty-treas., Cost Association
of the Paper Industry. Address at the annual
meeting, of the Writing Paper Manu-
facturers' Association, New York
April 1922

As a start, I want to say that I have no apologies to make for our Association. We feel we have been and are doing everything possible to forward cost work throughout the industry with the limited funds at our disposal. We have eight Local Division which hold periodical meetings throughout the country, thereby permitting the cost men in each locality to get together and discuss their various difficulties. By the issue of mimeographed articles, we are striving to impress upon all mill executives how helpful they could make their cost departments if they would pay as much attention to them as they do, for instance, to their Sales Departments. We hold two conventions annually (and in future they will be held one in the east and one in the west) at which addresses are given by leading cost men in the pulp and paper industry on matters of vital interest to all of us. We have never wasted any of the money entrusted to us by the industry on entertainments, but have confined ourselves strictly to business at these conventions. I say this in no self-righteous spirit, but because I know this is a time when everyone is striving to effect economies and I want to ask you not to try and effect any economy by cancelling your membership in the Cost Association. You will remember some years ago a cost committee appointed by your Association drew up a report whose purpose was to suggest to your members a method of determining costs which in its general principles offered a uniform method or basis of arriving at results. The committee stated in this Report that if certain elements of costs are considered by one concern and are disregarded by others, a much wider variation will result than might be expected by varying conditions in the mills. The Cost Association today is still preaching uniform methods as opposed to uniform costs. We cannot legally have the latter, namely, uniform costs, as you of course are aware, but we are encouraged to have uniform methods for cost finding and cost accounting, and I am here today to make an appeal to you to assist us in our work of impressing upon all manufacturers of writing paper the necessity for using uniform methods in cost estimating and cost accounting, if the writing paper industry is to be placed on a sound economic basis.

You all know better than I do the difficulties of doing business today, but no matter how difficult it is to obtain orders it seems to me that there should not be any necessity to pay a bonus to your customers to buy your paper, and I believe the main reason why some of you have had to do this is because others are manufacturing and selling paper without a proper knowledge as to the real cost to them of doing business. In other words, they do not actually know what their actual costs are. It has often been pointed out how easy it is for manufacturer to go on for some time manufacturing at a loss without being actually aware that he is doing so. Business runs in cycles and it is necessary to make the good years pay for the bad. I know it is hard to start building up reserves in bad years, perhaps it is impossible to do it, but we can at any rate learn the necessity for building up these reserves in the bad years, so that when the good years do come, we shall not again miss the opportunity to set up such reserves. I am referring more particularly to the necessity for building up a reserve for the loss caused by idle time, "unearned burden", "unabsorbed burden", being some of the other titles under which this account masquerades. Against this account are charged those overhead expenses which should not be included in "costs" when production is below normal. We cannot during a period of subnormal production load our costs with all our overhead charge. Only the right proportion can be so charged, and the balance must eventually find its way into the debit side of the profit and loss account, unless we have a special reserve account against which we can charge it. One particular value of a cost system to which attention was drawn in your cost committee's report was the value of being able to determine which of your lines of production are the more profitable and to be able to determine this it is necessary that the cost system which you install should show the individual cost of each grade of product sold. It must also show the detailed cost of materials, labor and expense in the various stages of manufacture, so that by comparison of these costs you may be able to work economies whenever you see that the costs are abnormal.

As a start toward a good cost system I want to make a particular appeal to you to assist your cost department by providing proper store rooms for those articles that can be stored therein and proper facilities for piling properly those raw materials which have to be kept in the open. We all know how much care is taken to guard against any loss of assets in cash form. You have special accounting systems to guard against the loss of even one cent without proper accounting therefor, but as soon as this cash is turned into raw materials or supplies, your interest in many cases almost ceases and these materials or supplies are allowed to lie around where anybody can use them as they please. Of course, I know that in many mills good inventory systems are in operation, but I also know that in many others such is not the case and I want those mills to know that if they are to be able to accurately estimate and find their costs, they must take steps to keep an accurate inventory of their raw materials and supplies. The Cost Association has recently sent out to all members of the American Paper and Pulp Association a pamphlet entitled "Perpetual Inventory or Stores Control." This pamphlet written by the Cost Accountant employed by the U. S. Chamber of Commerce contains many good ideas on this subject.

Another important point on which I would like to touch is the necessity for having your cost books tied in with your general books, for unless you do this, you undoubtedly provide plenty of opportunity for errors in the calculation of your costs, and it may be that some of these errors will not be discovered until you make an attempt to adjust the difference developed at the end of your financial period.

Perhaps one of the most discussed items of cost is depreciation. The Cost Association is endeavoring to bring about the adoption of uniform depreciation rates in each branch of the industry and a report will shortly be issued by a special committee appointed for the purpose. We have been advised by the U. S. Chamber of Commerce that the Treasury Department at Washington looks favorably on the idea and several associations have already come to an arrangement with the Treasury Department regarding this question. Although the Treasury Department will not bind itself to accept these depreciation rates, yet they are willing that they shall be used and state that unless special circumstances arise wherein the Department thinks the rates should be varied, they will in most cases accept them

"The association has led American industry in a campaign to secure national forestry legislation, and it was under Mr. Moore as chairman of the committee that this work was initiated. Studies of means of preventing pulp and wood decay have been stimulated, and co-operation established through a special committee, with the United States Bureau of Standards.

"Closer coordination of the Technical, Cost, Superintendents and Salesmen's Associations to serve the entire industry has been accomplished during the year, and these are only a few selected examples of the work that is being done for the industry as a whole by the federated organization."

HOUSE ORGAN EDITORS IN THE PAPER INDUSTRY

At the request of A. Ellis Frampton, Editor of *The Hammermill Bond* and Chairman of the 1922 National Safety Council Editors' Program, an appeal is made to the editors of Paper Mill Employees' Publications to support the Editors' Program in connection with the National Safety Congress at Detroit the last week of August. For the first time in four years the plant Editors did not have a meeting with the National Safety Congress in 1921. This was due to very unfavorable business conditions, but the skies are somewhat rosier this year and Industrial Editors are called upon to face a field beset with problems in connection with changed business conditions.

The Editors will conduct two meetings, one a round table luncheon on "Safety Through The Plant Magazine," the other, a session on Publication Problems of particular interest to editors. These will be held either August 29, or August 30, the exact date to be announced later.

All Paper Industry editors are urged to attend if possible, as the discussions are stimulative, and the editor is sure to return to his work more efficient and with many new, usuable ideas.

The employees' magazines of the paper industry have come through the period of depression better than those in many other industries, and with a return of prosperity their editor will have opportunity to continue their important work along the lines which been partially interrupted by the unfavorable business conditions of the past two years.

At the annual meeting of The Sandy Hill Iron and Brass Works, Hudson Falls, New York, held May 1st., the following directors were elected:— A. J. Kennedy, T. C. Tefft, Jr., C. W. Kellogg, H. L. Broughton and J. M. Ferris. After the stockholders' meeting the directors met and elected the following officers:— A. J. Kennedy, Pres't., R. C. Tefft, Jr., Vice Pres't., and J. M. Ferris, Secretary-Treasurer.

IMPROVEMENT IN INDUSTRY CONTINUES

The improved conditions in the paper industry which were beginning to be evident at the time of the April convention have continued during the past month, with further increases in orders, and generally better prospects in the entire industry. In this the paper industry is keeping step with the general improvement of business.

The buyers are not yet in the market for large quantities of paper, but the whole situation is notably stronger than it has been for many months past. The Federal Bank reviews, which devote some space each month to the paper mills in their regions, are optimistic in their general outlook upon the paper business.

There is reason to anticipate a possible decrease in orders during the summer, this being a normal seasonal condition, but if there is a slight drop off in the quantity of business in sight, there is every reason to expect that business will come back stronger than ever in the fall.

Advertising Contracts Affect Market

The outlook for book paper is likely to be influenced by the manner in which increased advertising is being contracted for in the big magazines. *The Saturday Evening Post* for May 13 is said to carry the largest amount in advertising, figured by amount of investment, ever carried by any American publication. Such incidents as this can not fail to reflect increased orders in this grade of paper.

All in all, it can be said that the industry is in a good condition. The industry has come through the business depression without serious complications, even though the money losses were great, and is ready to go forward with an anticipation of better business in the months to come.

The paper decline is temporarily over, says Babson, in an advice letter to buyers, and he adds that some paper purchases are logical. In this review he points out that the producing capacity of the country is far from being taxed, but he adds, "The price, following economic laws, has established a new low level, now about 35 per cent. above the five-year average previous to 1913. A further immediate reaction is not expected. The potential demand for paper will certainly increase, rather than decrease. Existing conditions justify the purchase of paper of all grades for two months ahead, up to the third quarter of the current year." Under pulp wood, he advises interested clients to investigate, taking advantage of all attractive offers.

Pulp Wood Import Low

The pulp wood situation is certain to have an important bearing on the market conditions in the near future. The cut was far below normal during the last season, being about 28 per cent. of the normal requirements. Small quantities of wood can be secured at low prices, but any requirement of a quantity of wood might mean an advance in prices, and there seems to be little doubt that a year from now will see the cost of pulp wood definitely higher than it is at present. The immediate danger is that if the mills allow their stocks of pulp wood to become depleted, the demand will cause a spurt of buying which will bring about conditions similar to those existing early in 1920.

NO MILL AT PRINCE GEORGE

Prince George B. C., despatch.— Eastern interests will not erect a pulp mill here as had been contemplated, Hon. T. D. Pattullo, Minister of Lands, informed a deputation of citizens here. Mr. Pattullo told the delegation that negotiations with the promoters in Montreal had failed by reason of their insistence upon fixed royalties.

A Dictionary of Pulp and Paper Mill Terms

(Continued from last issue.)

Dew Point. See **Humidity.** Temperature at which moisture is condensed from the air.

Dextrin. (Otherwise British Gum, Starch Gum.) An adhesive or sizing adjunct prepared by heating starch with or without a little nitric or hydrochloric acid. Malt extract, by virtue of the diastase it contains, acts thus on starch, which is then said to be "converted."

Diaphragm. In flat screens, the vibrating floor under the plates—sometimes of leather, but usually composed of several layers of cotton impregnated with rubber and with a rubber surface. Any flexible supporting medium.

Diastase. A peculiar nitrogeneous subtance which is capable of acting upon starch, converting it into a sugar and rendering it soluble. Can be used for removing starch from rags.

Dicotyledon. A botanical term applied to plants whose seeds on sprouting produce two seed leaves, in trees such as beech, ash, pine and conifers.

Diffuser. The steel tank, commonly used in sulphate pulp mills, in which the black liquor is separated from the pulp after digestion.

Digester. The container or autoclave in which chips are cooked under pressure in making chemical pulp.

Direct Current. A current in which the separate urges caused by cutting of the lines of magnetic force are compensated by others of the same interval.

Direction. In paper, refers to the arrangement of the fibers in the sheet. Machine direction is the line of travel from wet end to reels, and cross direction at right angles thereto.

Dirt. In paper, anything that mars the appearance of the sheet.

Disc Barker. A machine consisting essentially of a revolving disc with knives set in its face. In rotating the stick of wood against the disc, the bark is shaved off. See **Barker.**

Disc Evaporator. See **Evaporator.**

Dissolver. The tank, usually equipped with an agitating device, in which soda ash, size, or other solid or semisolid materials are treated with water to form solutions for use.

Doctor. A wood or metal plate of proper design lying horizontally on a revolving roll or cylinder, to remove particles of paper or pulp or other materials, thereby maintaining a smooth surface on the roll; as, "calender doctor."

Dolomite. A natural carbonate of magnesium and calcium sometimes used for acid-making in sulphite pulp mills. The source of magnesium lime commonly used in milk of lime and tower systems.

Double coated. Coated both sides.

Double Crown. See **Sizes of paper,** Occasionally 30½" x 20½".

Double Demy. See **Sizes of paper.**

Douglas Fir. (Oregon Pine—Pseudotsuga Douglasit.) A coniferous tree growing on the Pacific Slope towards the North, free from branches to a considerable height. The tree itself is at times 300 feet high. The waste from the lumber is a source of pulp by the soda and sulphate processes.

Drab-Sealing. Drab colored sealing papers.

Drapers' Caps. Very thin brown papers, glazed on one side (M.G.) made of wood pulp, used in many trades for wrapping small articles.

Draw. The condition of having one part of the paper machine traveling somewhat faster than the portion behind it, in order to compensate for the elongation of the web of paper.

Drawing. Paper of various qualities used by artists and draughtsmen. The best qualities are made of cotton or linen. Sulphite and mechanical pulp with china clay makes a good grade for school work. Finish and sizing depend on special requirements.

Drum

(1) A rotatable container. See **Barking-Drum.**

(2) A metal cask used for bleach, sulphuric acid, etc.

Drum Washer. A hollow round or octagonal vessel consisting of a framework covered with wire cloth rotating on the surface of stock as in a beater or washer. It is equipped with tangential blades, running to its edge. Its lower edge is submerged. The water passes through the wire and is removed by the scooping action of the blades, being discharged through the axis. Sometimes a hollow cylinder inside of which the material is washed during rotation.

Drum Winder. Apparatus for forming rolls of paper from a web; it may be either single or double drum.

Dry End. That portion of the paper machine consisting of dryers, calenders, reels, and winder of a paper machine.

Dryer. A revolving steel cylinder, usually from 3 to 6 ft. in diameter, internally heated with steam, over which paper is run to be dried. The dryer part may have a number of cylinders usually in two tiers. On board machines without dryer felts, the dryers are frequently arranged vertically as many as six in height or in three or four tiers. On a Yankee or M.G. machine a single dryer of large diameter is used.

Dryer felts. Heavy cotton canvas cloth (sometimes of wool) a little wider than the dryers, running the entire length of the dryer part and arranged to hold the paper against the face of the dryers. They are referred to as top and bottom dryer felts, as there is at least one for each tier of dryers. On board machines, usually no dryer felts are used.

Dryer Part. See **Dryer** and **Dry End.**

Drying. Strong tough rag or wood pulp papers, of medium thickness, used for letterpress, copying books, and similar purposes. Unsized and absorbent.

Drying Royal. See **Drying.**

Dry Printings. A term applied to common papers used for news, printed dry from the reels of the printing press, which were formerly damped when the sheet was reeled off to the Hoe press.

Duplex. Paper having one color on one side and another on the other side, produced by various method of manufacture.

Duplicating Papers. Also called manifold. Unsized and half-sized papers used for taking copies on cyclo style, mimeograph, and similar duplicating machines. Best qualities are composed largely of **spruce** sulphite or esparto, but the common varieties contain mechanical pulp.

Duster. A machine containing revolving arms through which rags or old papers are passed to remove dirt, buttons, etc.

E

Easy Bleaching. Slowly well-cooked pulp, well washed. Having as much non-fibrous matter removed as possible. Chemical pulp requiring 15 per cent or less bleaching powder or bleaching.

Edge Runner. A pulp-grinding machine developed in Europe in which circular stones in a substantially vertical position revolve in a circular stone trough. Originally used in treating treating ores. Used in Kraft paper and pulp mills for reducing the hard cooked stock. "Kollergang."

Edwards' Attachment. An arrangement whereby light-weight papers are carried or led on an upper felt from the first to the second press, and from second press to dryers.

Effect. One of the stages or units in compound vacuum evaporators. There are usually three or four units or effects running in series. See **Evaporator.**

Efflorescence. The property of losing water of crystallization. Washing soda is an efflorescent salt.

Electrode. A conductor by which electricity enters or leaves any piece of apparatus.

Electrotype. A plate for printing illustration prepared by corroding a metal surface upon which a photographic impression has been made.

Elephant. See **Sizes of paper.**

Elutriation. The washing out by means of water, of a light or finely divided material from a heavier or coarser one, as in examining clay.

Embossed. Papers upon which a raised or depressed design has been formed by means of special steel rollers, the surface of which has been cut to a particular pattern, or by one metal roll carrying the engraved pattern and the other of compressible material such as paper or cotton.

Emerson. A form of refining engine, from the manufacturer's name. See **Jordan.**

Emery. A very hard abrasive. The crushed artificially prepared mineral corumdum. Oxide of Aluminium.

Emery Paper. Used for cleaning and brightening metal goods. Prepared by coating a strong paper, previously moistened with glue, with fine emery.

Enamel. A term applied in various ways to highly polished coated papers used for box covers, and to cards with a mixture of zinc white and glue.

End. See **Book End.**

End Papers. Usually termed fly leaves. Odd sheets placed by the binder at front and back of a book.

Endogens. Plants that grow by developing new substance internally; e.g., grasses and palms.

Engine. A refining engine. See **beater.**

Engine Sized. Paper sized in the beater or mixer. Usually refers to the use of rosin size. Called E. S. Papers.

Envelope. Papers having special qualities for folding, strength, durability, etc.,—to be used for envelopes.

Eosin. A coal tar dyestuff obtained by the action of bromine on fluorescein dissolved in acetic acid. Gives a reddish shade, but is very fugitive when exposed to sunlight.

Esparto. A grass (Stipa Tenacissima) growing chiefly in Spain and Northern Africa. Cooked with soda it yields about 45 per cent. of fiber very suitable for magazine papers. Much used for this purpose in Europe. Not used in America except as it occurs in old magazine papers.

Esparto Papers. Papers made of esparto "per se," or mixed with small proportions of wood pulp, specially adapted for magazine and writing papers.

Ethyl Alcohol. Spirits of wine, grain alcohol, C_2H_5OH — produced by the fermentation of sugars.

Evaporator. Apparatus to remove water by heat, with or without vacuum. The principle is to expose as much surface of the liquid to be evaporated as possible to a counter current of heated air of low relative humidity, or run it over heated surfaces. In vacuum evaporators the reduction of the boiling point at reduced pressure is the means of boiling the liquid several times with its own steam at reduced pressure, as in multi-effect evaporators. Porion's disc evaporator consists of dics revolving vertically half submerged in the liquid to be evapored, all in an enclosed chamber through which heated air or furnace gases are passing. See **Yaryan.**

Exogen. A plant that grows by developing new substance in external layers, as an ordinary tree, showing concentric rings.

F

Fahrenheit. See **Thermometers.**

Fast and **Loose.** Pulleys placed in pairs, one of which is keyed to, and revolves with the shaft. The other revolves on the shaft and carries the driving belt when a machine is not in use.

Featherweight. Very light-weight, bulky papers used in books, etc.; also, thin opaque writing papers made from soda pulp. Sometimes refers to tissues.

Feed Water. The water supplied to a boiler.

Feel. That characteristic of paper which concerns the sensation transferred to the fingers. A means of judging quality but more particularly the finish.

Felt. A woven fabric composed of wool or cotton, acting as a carrier of the formed sheet. Wool felts are used on pulp wet machines, and the wet end of paper machines, and cotton felts customarily on the dryers.

Felt Rolls. Rolls of wood or any suitable metal carrying wet or dry felts sometimes arranged with apparatus for correcting tendencies to run out of line.

Ferric Chloride. A compound of iron (FeCl 6H O), which with ferrocyanide of potash yields Prussian Blue. If a solution of ferric chloride is applied to one side of a sheet of paper, and a solution of tannic acid to the other, some idea of the extent of sizing can be had by observing the depth of the black color reaction between the two chemicals, which will be much more intense in slack sized papers.

Ferric Nitrate. A reddish-colored iron salt, which, added to the pulp in the beater, produces many shades of cream printing papers when used in small quantities, and of buff colored papers when used in greater quantities.

Ferric oxide. Oxide of iron (Fe_2O_3); iron rust. The coloring pigment in venetian red, red ochre, etc. Also called sesquioxide.

Ferricyanide of Potash. Red Prussiate of Potash. See **Turnbull's Blue.**

Ferricyanide of Potassium. See **Potassium Ferricyanide.**

Ferrocyanide of Potash. Yellow Prussiate of Potash. See **Berlin Blue.**

Ferrous Oxide. Protoxide of iron (FeO).

Ferrous Sulphate. Iron sulphate ($FeSO_4$). Usually in green crystals, $FeSO_4 7H_2O$, used as an adjunct in dyeing paper. Copperas, Green Vitriol. To some extent used instead of alum in coarse papers.

Fiber

(1) A plant cell much longer than wide and composed essentially of cellulose. Fibers compose the framework of plants and trees.

(2) Wrapping paper composed largely of chemical pulp.

Fiber Leather. See **Leather Board.**

Filler. China Clay, Pulverized Talc, Asbestine, any fine mineral or other insoluble powder of proper color used for increasing the opacity or improving the surface effects of paper.

Filter

(1) To clear or purify a liquid by passing it through a strainer such as fine wire, cloth, other fabrics or sand.

(2) The apparatus used for filtering liquids in manufacturing plants, chemical factories, and laboratories.

Filter Press. An apparatus for filtering under pressure or vacuum to save time as compared with gravity filters. The lime sludge from causticizers is frequently treated in a filter press.

Finishing Room. That department of a paper mill containing calenders, cutters and packing arrangements.

Fir. A family of coniferous trees, typified by the balsam.

Fireproof. Made of materials, such as asbestos, that do not burn or do not readily burn. Paper and board may be rendered partially fireproof by treatment with magnesium-sulphate solution.

Fix. To cause to adhere, as with dyes, or size. See **Mordant.**

Flat Screen. See **Screens.**

Flash Point. The temperature at which an oil gives off sufficient inflammable vapor to be ignited momemntarily by a flame of standard size. See **Oil Test.**

Flax. The plant whose fibers are used for linen (Linum usitatissimum). These fibers occur in paper made from linen rags. Straw from flax cultivated for the seed is practically a waste material in Minnesota, North Dakota and some part of Western Canada—several hundred thousand tons in quantity per year. A possible source of paper-making material. See Bulletin 322, U. S. Dept. Agr.

Flint. Papers, usually coated, to which an extra polish has been imparted by friction with a long flat stone moving quickly to and fro across the surface of the paper as it comes from the calenders.

(To be continued.)

What The WoodsMen Are Doing

(Excerpts from the Proceedings of the annual meetingof the Woodlands Section, A. P. and P. A.)

REFORESTATION AS APPLICABLE TO PRIPATE TIMBERLAND HOLDINGS

A — Forest Inventory Necessary

Mr. Ellwood Wilson, of the Laurentide Company, said that in some sections of the country where there was sufficient timber for continuous operation indefinitely, artificial reforestation was neither necessary nor advisable. He said that the first step was an inventory to show what the company possessed in order that it might determine intelligently the need for reforestation. This whole question would be determined by the answer to the question, "Is it more economical to bring wood in, or to plant nearer the mill in order to insure a sustained supply?"

If you find that you have sufficient young growth coming up in your timber lands, or your timber lands are in such condition that there is enough young growth coming in to supply you in the future, you can forget the whole subject of reforestation, unles you are in the position that some people are in the country; that is, your timber supplies although adequate for a long time, are getting more and more inaccessible, or you are suffering from fire, budworm and other insect attacks. If your stands are getting poorer, progressively poorer, and your logging costs are going up, that is another situation.

I have no doubt that you will all agree with me that as time goes on, logging costs will have to increase as the accessible timber is pretty well cut off, and you will have to go farther back. Labor is never going to be any cheaper than it is, and it is never going to be any more efficient. We are already at the point where we have got to develop mechanical means for logging in order to decrease the cost.

Now there has been a very unfortunate slogan going around, "Let's forget reforestation and keep out the fire." I think that attitude is one of greatest menace to the whole subject of timber supply, that I know of. It is said that all we will have to do is keep out the fire and nature will take care of the rest. That isn't true, and anyone who stops to think about it knows that it isn't true.

Then there is one question which has not been, so far as I know, brought up at all. Suppose we keep out the fire and suppose that conditions are such that natural regeneration will come in, in satisfactory amounts. What is the cost of that natural reproduction? Now, if you will sit down and take your pencil and paper, take your compound interest tables, take the cost of your land and the cost of your fire protection and administration, etc., and put your calculations for natural reproduction in one column and your cost for planting in the other column, you will have the surprise of your life.

B. — Advantages of Plantations

Mr. Wilson emphasized the time element in getting the wood to the mill, showing that some companies had to depend on three year wood as contrasted with almost immediate delivery where plantations might be established within 330 miles of the mill. He recommended that no reforestation be done on land not belonging to the company or on land distant from the company. He said:

Fires are more easily controlled on planted lands, and insect depredations also are more easily controlled, and as I say, you will eliminate items of spraying, insurance and other things to a large extent. Instead of keeping a six or eight or ten months' supply, you can keep a two or three months' supply, or perhaps operate immediately from the stump to the mill if the transportation is of the most up to date kind. Where electric power is available, perhaps you can have short railroads cut out into the plantations and cut the stuff and take it immediately to the mill. The rails could be light, so that the tracks could be moved rapidly and you could use all sorts of appliances for cutting down the timber and handling it rapidly.

You all know that logging is an engineering problem; that it is nothing more or less than transportation. I do not see the idea of buying timber today to hold for forty or fifty years, when at the same time you can get very much better quality of timber, a very much heavier stand per acre, and very much easier logging conditions and very much easier transportation out of your own plantations.

If you could do away with your long and expensive drives; if you could do away with all the rotten timber; if you could eliminate the using of balsam and use only the spruce, you would be in very much better condition, and these things are absolutely all within your control in the planting proposition.

Once you get the trees planted, all you have to do is keep the fires out, and you have got to keep the fires out of your natural stands anyhow. The plantation is near home and you have your forest always at hand, so in the event that insect depredation commences, you can undertake control measures. If your timber is only attacked when it is matured, you can absolutely determine your rotation and get your stuff out before the insects commence to work.

THE PRESENT TIMBER SUPPLY

Mr. P. T. Coolidge, of Bangor, Me., gave a figure of five hundred million cords of soft wood pulpwood in the northwestern United States and Canada, with an average annual cut of seven million cords, and then showed that the forest was being reduced by cut, fire, and insect and fungus depredations, so that it was almost impossible to estimate how long the present stand would last, based on present consumption and rate of growth. He then pointed out the increased use of hardwood in the manufacture of paper and suggested the competition from the Pacific Coast mills and European countries. His conclusions were as follows: "All this means either curtailed production through insufficient supply, the development of new regions, or reforestation."

Mr. Coolidge then suggested the following detailed policies governing reforestation and planting operations:

A.— Decision As To Planting

Different plants will find different policies advisable. A plant located in a region of depleted timber supply will find that if reforestation is advisable at all, much more thoroughgoing action will be necessary than for a plant well supplied with standing timber. Any company may be expected to take all practical measures to maintain its timber supply as long as possible. The best way to work out any policy is to take the easiest steps first. Is fire protection what it should be? Is the utilization as close as is practical? Can the timber supply be increased by diameter limit cutting on areas where there is no danger of windfall? Are there still opportunities for buying tracts bearing young natural growth? It is a very pertinent question whether reforestation is worth while so long as tracts of growing timber are on the market, although it should be kept in mind that the yield per acre from plantations is estimated as several times the yield of natural growth.

L.— Planting Pointers

In determining the advisability of a reforestation policy, the character of the land to be planted, and the cost of planting are to be considered. Planting should be begun on soils which promise the best yields, and on situations where the cost will be low, and where the stand will be protected from fire. Planting should not be planned on the erroneous theory that unproductive land represents loss. It would be poor economics to attempt to make all the waste places in the world productive. With good fire protection, practically all land in the northeast which has yielded a good cut of soft wood will reproduce satisfactorily to soft wood in ten to twenty years. On a large proportion of the northern forest lands, therefore, reforestation is unnecessary. On badly burned areas, not reproducing to poplar, reforestation is frequently necessary if a growing stand is to be restored within reasonable time.

C.— Hardwoods

On hardwood lands, softwood reproduction is not good. I doubt the advisability of sacrificing present hardwood stands or of incurring the expense necessary to do this as a preparation for planting, and I believe that hardwood will prove worth holding for some purpose. The best time to plant hardwood lands is probably within a few years of the time the hardwood is cut. On extensive areas on the Adirondacks where the hardwood is being cut, reforestation with softwoods appears particularly practical, if costs permit.

The method of planting has an important bearing upon the cost and practicability of the project. I believe that hardwood which is to be cut in a few years can be underplanted with one or two-year-old seedlings at cost much less than the cost of reforestation of unshaded areas where expensive transplants are necessary. At New Haven, the Yale School of Forestry in 1902, successfully underplanted hardwood with one-year-old Norway Spruce Seedlings at a cost of not more than $2.00 per acre, or less than one-third of the cost of planting in the open as figured at that time. Seedlings so planted in the north would be protected by the snow for a few years from damage in logging the hardwoods, if logging were done after planting. The fact that hardwood areas have generally low susceptibility to damage by fire also favors planting of this kind. The cost of any method of planting is an important consideration, and I think that there is ample field for investigation to see if planting costs now figured at $10 or $20 per acre cannot be materially reduced.

D.— Taxation

In estimating the cost of producing timber by reforestation, an ample margin should be allowed as insurance against losses by fire or insect attack. Taxation is another uncertain element, although it is hoped that the taxation of forest plantations can be placed on a scientific basis in all of the northern states within a few years. In this connection, a study to determine the acreage in the northern states upon which planting will be advantageous would be very useful. Such a study would aid in solution of the tax problem and would give invaluable information relative to the future of the timber supply.

E.— "Plant Now"

In conclusion, I believe that the problem of reforestation calls for careful consideration at this time. Whether extensive reforestation would be advisable for all companies in the near future is another matter, but I think that the problem should be carefully considered at once. The very fact that reforestation will not be undertaken by many companies leads me to feel that any plantation made at the present time at moderate cost will undoubtedly yield satisfactory interest on the investment. When labor can be obtained for reasonable cost, and when there is ample money, it would seem to the writer highly advisable for many companies to undertake reforestation on a small scale. The present high cost of nursery stock, for example, does not encourage investing in plantations to mature fifty or sixty years hence, but it is to be hoped that conditions of this kind will not last long. Reforestation will undoubtedly become increasingly important ,and planting on a small scale during the present years would be a great advantage from an experimental point of view, and would yield information that would help to reduce costs when planting on a larger scale becomes advisable. The general trend of stumpage prices is, of course, the safest guide to determination of future stumpage values near any plant, and affords the best basis f or determination of present policies affecting any phase of the problem of future timber supplies.

Undoubtedly the competition of other regions tends to increase competition within the northeastern field and so to render difficult the making of investments necessary to the future of the industry. It is to be hoped that the situation can be improved by singleness of policy at least, among the different companies, in the broad problem of reforestation versus depreciation of mamnufacturing properties. It is possible that aid in some form, constructive rather than restrictive, through the State or Federal Governments, will be found necessary if the pulp and paper industry is to be perpetuated in the northeast. It is encouraging, by the way, to know that detailed study is now being given to the whole subject by the Forest Service.

SINKAGE

Mr. E. S. Holloway, of the Hammermill Paper Company, sent the following contribution:

Our experience during one drive of 60 miles, a 52-day operation, passing through 7 miles of lakes and holding in one lake for two weeks, gave a sinkage of 6.3 per cent. of 4-inch wood. We have no exact figures for log lengths on the same type of operation, but have assumed a figure of 6-8 per cent. as about correct. Undoubtedly, 4-foot sinks less than log length stuff on this river as it is usually the top and heart rotten wood which sinks, and in the case of logs, a small length of knotty top or rot will be sufficient to sink the whole piece, particularly while in the lakes. It is difficult to obtain accurate figures on sinkage as it seldom occurs that there is a complete clean-up of the river in the fall, and also as under the head of sinkage comes the loss from breakage which is considerable in small streams where dynamite is used to break the jams.

Mr. D. E. Lauderburn, of the Pejepscot Paper Company, submitted the following on "Results of Sinkage Tests on the Androscoggin River":

These tests were made between July 14 and Oct. 6, 1921, in all instances with 4-foot rough wood. Six booms with 100 sticks in each were placed in a small sheltered pond communicating with the river. The wood was classified as follows:

Boom No. 1. Sound Fir, 6-inch diameter and smaller, which had never been in the water.

Boom No. 2. Sound Fir, larger than 6-inch diameter, which had never been in the water.

Boom No. 3. Sound Spruce of all sizes, which had never been in the water.

Boom No. 4. Spruce and Fir sticks of all sizes, containing rot of any kind, heart-rot or sap-rot, which had never been in the water.

Boom No. 5. Sound Fir, 6-inch diameter and smaller, which had been landed on the ice the previous winter and held in a pond until shipped by rail early in July.

Boom No. 6. Spruce and Fir, containing rot, from the same source as that in Boom No. 5.

Results.

1. None of the sound spruce sank after 83 days in the water. This and the wood in Booms 1, 2 and 4 had prob-

ably been piled at the shipping points for 4 or 5 months, and dried out pretty thoroughly.

2. None of the sound fir which had been landed on the ice and held in the pond at point of shipment for about 4 months sank after 49 days in the boom.

3. Of the sound fir, 6-inch and smaller, which had never been in the water, 1 per cent. sank in the first two weeks, none afterward. Total period in the boom 84 days.

4. Of the sound fir larger than 6-inch diameter, none sank in the first three weeks, 2 per cent. sank in the fourth week, 1 per cent. sank in the eighth week, and none thereafter; 3 per cent. loss in 84 days.

5. Of the unsound spruce and fir which had had some 4 to 5 months' soaking at the shipping point, none sank in the first three weeks in the boom; 3 per cent. sank in the fourth week and none thereafter. Total period in the water, 43 days.

6. Of the unsound spruce and fir which had never been in the water, 4 per cent. sank in the first two weeks; 1 per cent. in the sixth week, 1 per cent. in the tenth week, and 1 per cent. in the twelfth week. Total sinkage, 7 per cent. in 83 days.

Conclusion.

1. Sound spruce which has been kept in cordwood piles for a few months does not sink.

2. Large fir sinks more readily than small fir. This is contrary to expectations and general experience.

3. The unsound wood shows a high percentage of sinkage.

4. As the sinkage of wood which had previously been in the water was less than that which had never been in the water, it may be assumed that part of the sinkage had already taken place.

Application of These Figures to a Large Supply of Wood.

Assuming that wood in storage at a mill is 5 per cent. containing rot, 47½ per cent, sound spruce and 47½ per cent. sound fir, the total sinkage indicated would be about as follows:

5 per cent. unsound—sinkage, ...	.35 p.c.
47½ per cent. sound spruce—sinkage, 0 p.c. .	.00 p.c.
47½ per cent. sound fir—sinkage, ...	.95 p.c.
Total 100 p.c.	1.30 p.c.

In commenting on this report, Mr. Wilson said that they had recently boomed 101,000 logs in a lake and after the dam had been cut they pulled out of the mud the logs which had sunk. These were found to be 2 per cent. of the total number driven, of which 90 per cent was balsam. He said that in practically every case the sunken logs were rotten or were the top logs of the balsam. It was pointed out that there was less loss from sinkage on peeled wood than on rough, and that peeling practically prevented the loss from sinkage on small fir. Mr. Wilson said:

"I think we have got to study this whole question of pulp measurement and standardize it, and then we could go a long way toward solving this problem of what we now call 'sinkage.' "

PUBLICATIONS RECEIVED

Three brand new bulletins have been prepared by the Canadian Ingersoll-Rand Co. of Montreal, entitled PM-107, "Ryther" Twin Roll Chip Separator;PM-109,"Circo Pulpwood Barker; PM-115, "Circo" Pulpwood Chipper (88 inch). These bulletins are printed with customary Circo excellence and it will be worth while to write the company for copies of them.

PULPWOOD BUSINESS IN QUEBEC IS DULL

The purchasing power of pulp wood in the district of Quebec is still inactive, and the dealers are in a state of gloom, especially those with large stocks stored along the railway lines who are unable to sell their wood except at a loss. The Quebec dealers, spoken to on the subject, are crestfallen over the situation. One of those interviewed said his last sale to the American mills took place in January last, when he disposed of 1,000 cords and not one cord since, and furthermore, he had not as yet made the delivery.

The price of pulpwood has, in consequence, fallen, and the American concerns who give out the statement that their storage capacity at their mills is congested with wood are offering $14 per cord delivered, a price that cannot be entertained.

There is a tremendous quantity of rough pulpwood piled along the railroads going to decay. It is suggested that the Canadian mills instead of cutting wood on their limits should purchase the pulpwood cut and piled along the various railroads throughout the province of Quebec. One dealer informed the "Canada Lumberman's" correspondent that the last sale he made to American mill purchasers only gave him the price of $17 per cord, delivered at the mill and besides he had to accept the purchaser's note for payment in three months.

The slump in demand and the unusually large quantity of pulpwood cut and falling into decay along the railway lines, has caused the Government forestry service to watch the scientific end of independent interests in their laboratories for the prevention of decay in groundwood pulp used in the manufacture of paper. The interesting investigation recently completed at the Forest Products Laboratories of the Department of Interior is likely to have practical results for the prevention of decay in groundwood pulp, which frequently deteriorates through the action of mould and wood-destroying fungi. This creating considerable monetary loss to the owners, is being watched with interest. The discovery which will, probably, mean the saving of millions of dollars to the pulp and paper industry and the country, has come out of the investigations as to the practicability of pulping fire-killed trees. The forest fires which every year destroy millions of dollars' worth of Canadian timber, leave behind them immense numbers of trees which are killed but not destroyed, by the flame. Such trees are never logged and the wood becomes a total loss. These fire-killed trees are attacked by insects and fungi and are a menace to sound trees, one very common result being the sap-stain, a dark discoloration of the wood next to the bark, due to microscopic fungi. It has been discovered that these trees can be saved and utilized for commercial purposes by ordinary bleaching methods, and that the sap-stain need not prevent the material.

The experiments being conducted in the laboratories of the Canadian Department of Interior, are being watched with interest in an investigation into the pulping qualities of fire-killed woods in general, and if results are satisfactory, a vast quantity of wood, hitherto wasted, will be converted into a valuable resource

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An announcement issued by the American Woodpulp Corporation of New York states that it has absorbed the J. J. Patricoff Company, Inc. According to the notice, Jacob J. Patricoff, head of the absorbed concern, no longer has any connection with either firm.

News from Europe

(From our Continental Correspondent.)

German News Print Dumping

Frankfurt, May 20, 1922. During the past week the Swedish newspapers have put up a vigorous warning against the dumping of German paper on the Stockholm market. For example, it is reported in the *Svenska Dagblad* that a lot consisting of 800 tons of machine glazed white newsprint in reels was delivered "freight free" and sold at 280 crowns (about 16 dollars) a ton. Another Swedish journal, commenting upon this and similar transactions of the illicit trader, observes that these sales are taking place at a time when hundreds of German newspapers are not appearing owing to the lack of paper.

Deliveries of Pulp; A Legal Decision

It is strange to see into what unreasonable disrepute the keeping of contracts — in all relations of life a first social duty — has fallen in Germany. The usual method of drawing agreements between business houses is for the manufacturer to insert the clause, "price and time of delivery reserved," leaving the purchaser to wait as patiently as he can until the goods and the bill arrive. The bill may be of inordinate size and become the subject of bitter litigation, as recently happened, with one good result, that the meaning of these terms, "price and delivery reserved," was dug out of their obscurity by the Highest Court at Berlin. The facts were as follows: The corporation T. demanded acceptance by the firm St. of a carload of ground wood. The price of the pulp at the time of delivery was 16,000 marks. The defendant firm disputed the validity of the contract and allege fraudulent delay. The court, however, ordered the defendant to accept the carload and pay the market price at the day of delivery, as the plaintiff in the terms of the contract had reserved the right to postpone delivery "as long as necessary". As regards the right to demand the market price, the court decided that this clause in the contract was binding on the defendant, since the plaintiff had made it clear that a rise in price was possible, and even probable, and that consequently the higher figure would be charged. In a letter February 26, 1920, the plaintiff wrote that the price had risen from 76 to 98 marks per 100 kilograms. The defendant replied asking that delivery be hastened. The plaintiff responded that owing to the lack of raw materials no definite time could be fixed for delivery. Finally, on June 22, 1920, the carload of pulp was delivered at the price of 160 marks per 100 kilograms, or 16,000 marks for the ten tons. Although it was not pretended that delivery could be postponed for an unreasonable time, it was held that the plaintiff was protected by the clause, "time of delivery reserved," and by the further statement in the letter, that delivery would be made as soon as possible.

It is funny to hear, after reading the decision of the court in this case, of the faith, or fidelity, or truth of German business men. The average merchant is a strange mixture of cunning and simplicity, simplicity which allows him to sign such a contract as the above. His temper, principles, business power, ability to resist the temptation to take advantage of a customer, are all as yet wavering and undefined, nothing is sure, and his fidelity is apparently mere instinct determined by chance associations. He shares with the Bolshevist a cynical indifference to the sanctity of contracts.

The Export of German News Print

The League of German Publishers has renewed the perennial inquiry into ways by which the best quality of newsprint may be saved from foreign purchase. They have been joined in this important matter by the Association of Stationers. Between them they have reached several most interesting conclusions. Most private firms grow deaf to patriotism when they hear the siren whisperings of the dollar. Everybody knows that newsprint and pulp makers are actively engaged on foreign deliveries and "pocketing the profits." There is, therefore, only one way of frustrating. The man who buys newsprint with German currency and sells it in Holland or Sweden for notes as good as gold: he must be deprived of his supply. Failing effective state action. The inquirers fall back rather uncertainly on the manufacturer. The initiative here should be left to the producers. The whole inquiry is typical of the dishonesty with which the question of exports is handled, for the last official trade returns show a falling off in exports of paper amounting to 50 per cent in the case of ordinary grades and 90 per cent in that of the best quality.

The New Russian Tariff protects Paper

The Soviet's desperate struggle with economic facts, the conflict between sanity and communism, are both exemplified in the new Russian customs duties. A writer in the Industrie und Handels-Zeitung, of April 30, analyzes the different clauses of the law, if such it be, that the Soviet government has enacted in the interests of the few private undertakings now left in Russia. For the duties are of two kinds; protective and those obviously intended to raise funds for the State. As regards the former it must be conceded that the Soviet has displayed considerably more intelligence than the old Czaristic bureaucracy, which was the instrument of German trusts and amazingly incompetent to deal with large Teuton corporations. The list of protected industries shows that the Bolshevist ideas of their economic position are by no means lacking in shrewdness; thus the paper, textile, and leather mills, come in for an abundant share of government favor; they are protected by the only effective duties; the duties on cotton, wood, and pulpwood being regarded by experts as too high. On the other hand duties of very moderate amount are levied on machinery, technical instruments, and agricultural tools. According to the Handels-Zeitung the tariff is an experiment, yet essentially a step forward on the road to normal economic relations. To the reader the experiment seems decidedly hazy as the Soviet government has not favored the world with the actual text of the measure. Consequently the actual amount of the customs duties in particular cases is a matter of official judgment. But experience is teaching the Russians that there is a wide division between their material interests and the crazy ideas of fanatical communists. That very much of the change of mind comes from necessity and the absolute need of bread is well known, and that reason will grow louder as necessity becomes greater, is seen in other ways in the reorganization of the Russian Bank and the permission now granted for private imports and exports, although these are severely restricted. Private capital is recognized to a certain extent for bills payable in gold roubles are now being drawn on the Russian Bank which issues checks on its funds in foreign, especially German, banks.

Nothing disgusts the outside world with religion more than a professed Christian to be saying and doing little things that are unpleasant to others.

British Trade News

(From Our London Correspondent)

London, May 31, 1922.

Some posers have been set the students attending the special courses on paper at their examinition in the Battersea Polytechnic. The idea is to test their general knowledge on customs governing commercial paper. The students were asked amongst other questions:—

Why should tinted linen strawboards discolor, and what precautions would you take to avoid discoloration?

Discuss "stretch" in paper briefly and give two examples where a high degree of stretch is necessary?

A printer has an inqquiry for 10,000 catalogues of 160 pages, demy 4to, for which he has 125 screen blocks for the inside and three color blocks of 150 screen blocks for the cover. Estimate suitable stocks for pricing the paper and use suitable substances. Show calculations.

What commercial test would you apply to ascertain whether a paper was hand-made, tub-sized, cylinder mould made, suitable for map printing and a greaseproof wrapping?

There were 41 questions altogether for the students, who have practical paper experts, including Mr. Sheldon Leicester, as instructors, and the results will be known in a few months time.

Scotch Mill Sold

A large illustrated daily newspaper has bought the Inveresk paper mill for something like £360,000 of which £160,000 has been paid down in money. British newspapers are making a bold bid to capture paper mills since the experiences of a Controller's power and Government's lethargy in a time when the country is at war.

British Chemicals

The Safeguarding of Industries Act—known as the "Key" Industries Act by some people—has lately received a good deal of criticism, good, bad, and indifferent. The Act was introduced to slap a 33 1-3 per cent. duty on foreign goods that were being sold under the cost price of British goods; also, to protect British industries from unfair foreign competition. Mr. Max Muspratt, chairman of the United Alkali Coy. Ltd., suppliers of certain chemicals to paper mills, now states that the Act might be repealed, but he agrees that the Dyestuffs Act—there is very little difference in the intention of either Act—might be retained. "I am quite satisfied", he says, "that the Dyestuffs Act was necessary in the interests of the country, though I dislike anything in the way of legislation interfering with industry. The safeguarding of Industries Act has been rendered almost entirely futile by the extraordinary slump in the German exchange. Whether it should be replaced by something on the same principle as the Dyestuffs Act, but applying to a very greatly restricted list of articles, might be a matter for theoretical consideration; but I am afraid the public opinion would scarcely entertain a second attempt to deal with the problem, the first having failed."

Up to the present time paper has not been dealt with under the Safeguarding of Industries Act, though it is over 12 months since the attention of the Government was called to the grievances of paper makers in regard to foreign competition.

Wages and Hours

The paper mill owners have now fully agreed to the conditions mentioned in agreement drawn up between them and the workers. Particulars appeared in the British Trade News of the "Pulp and Paper Magazine" last week. It is gratifying to known that the settlement has been so amicable. The early stages of the debates were at times not very hopeful.

Postal Rates Down

Yesterday postal rates were reduced in England and the belief is that papermakers and board mills will benefit. High postal rates retarded the use of paper considerably and cardboard firms felt the restrictions severely. The reductions will mean a greater consumption of paper of all kinds in the United Kingdom and that is something to be thankful for.

Canada

The newspapers and trade newspapers during the past three or four months contain articles on Canada's progress in many industries—and the question of immigration. Some of these articles are interesting and some of them are written by people who evidently do not know anything about Canada. But apart from everything, these articles should influence the investment of British capital in Canada and that is what we want nowadays. Good propositions in paper and pulp never fall on barren ground in London, but something in the way of soundness and assets must be shown on the first hand. Last week one of the financial papers here had a nice interesting article on Canada's paper and pulp industries. It was written from Montreal and dealt with the readjustment of prices, increasing output and the heavy exports to the States. The article concluded with the following two paragraphs: "The manufacturers of kraft and the higher grades of papers are also experiencing a better demand so that this is making for better market conditions for companies which are entirely devoted to the manufacture of pulp, both groundwood and chemical varieties. Another factor is the entrance of the United Kingdom into the Canadian market for supplies, orders having been booked for both chemical pulp and news print. It is also hoped that Canada will soon be able to regain her market in South Africa and Australia in the near future, so that on the whole the outlook is bright."

It is feared the optimistic tone of the last paragraph will take some time to materialise. There is no reason why any differentiation should ever be classified within Empire trading, but it is, and Australia was the latest in preferential episodes.

Bamboo Pulp

Kibuyu on the Uganda railway, it is stated, can produce 40,000 tons of bamboo yearly and Man Escarpment 20,000 tons. Tenders are now being invited "on the basis of a royalty per ton of air-dried pulp, and tender of less than 48 cents per ton will be given the exclusive right for 20 years." The bamboo in these two earas is reported to be plentiful and specially suited for pulp making and each block (of bamboo) must be cut once in 10 years.

LIEUTENANT-GOVERNOR VISITS NORTH ONTARIO

Iroquois Falls was honored on May 31 by a visit from His Honour, the Lieut.-Governor of Ontario, Mr. Henry Cockshutt, Mrs. Cockhutt, the Governor's Secretary, Col. Fraser; George W. Lee and G. A. Griffin, of the T. and N. O. Railway.

This is the first time that a Lieut.-Governor of the Province has paid a visit to the North, and it was therefore much appreciated by all the people who take an interest in forward movement in the north country.

He stopped at practically every town from North Bay to Cochrane, and was cordially greeted at every one of them, both as a man, and as the executive head of the Province. His visit shows that the people of the older part of Ontario are beginning to turn their eyes more and more to the north country and are beginning to realize the immense possibilities in natural resources.

Technical Section

REVIEW OF RECENT LITERATURE

A.— Properties, Chemistry and Testing of Raw Materials and Finished Product

A-1 Australian Wood Pulp Tests. Paper Trade J., lxxiv, No. 17, 18, (April 27, 1922). Tests have been made recently on various woods native to Australia to determine their suitability for paper making. Excellent results are said to have been obtained with the hoop pine and silky oak of Queensland. The latter is cheaply grown and make a very strong wrapping paper. Kraft papers can be made from cypress, pine, and white oak grown in the same province. In the State of Victoria, "woolybut", "silver top" and "mountain ash" have given most satisfactory results. -I. G.

A-3 The Decomposition of Typha Domingensis. E. HEUSER and J. HAUGEROD. **Papierfabr.,** xx, 253-262, (March 5, 1922). The authors determined cellulose, ash, silica, wax and fat, wood gum, and pentosan. Boiling the grass with milk of lime solution yielded a pulp which had a high lignin content. Sulphate treatment was carried out under a number of different conditions. -I. G.

A-3 The Renaissance of Straw Pulp and Paper. MARTIN L. GRIFFIN, North Dighton, Mass. **Pulp and Paper,** xix, 899-900, (Sept. 1, 1921). Owing to the rapid depletion of pulp wood resources, it is becoming more and more imperative to find some substitute which can at least tide over the scarcity until proper reforestation shall have secured a permanent supply of wood. The advantages of straw for this purpose are dwelt upon, not the least of them being that its suitablity for the purpose is well known, as it already has been extensively used for paper making. -A. P. -C.

A-3 The Structure of Cereal Straws. FRANCIS E. LLOYD, F. R. S. C., McGill Univ., Montreal. **Pulp and Paper,** xix, 953-954, 973-976, 1002-1004, 1025-1026, 1047-1050, 1071-1075, (Sept. 15, 22, 29, Oct. 6, 13, 20, 1921). A description of the structure of the "straw" of the barley **(hordeum)**, oat **(avena)**, rye **(secale)**, and wheat **(triticum)**, based upon samples from single localities and of ordinary ripeness or degree of development. Minor structural differences such as characterize various races of these cereals, and even a single race grown in different localities, are beyond the scope of this article. The purpose of this study was to determine (a) the character and length of the fiber, and (b) the possibility of distinguishing the elements (cells) of each in a macerated product, or in a straw paper. The findings on the four specimens were checked by comparison with pure (or nearly pure) strain material, and some of the conclusions had to be revised. A thorough-going study of this sort must embrace a large array of materials, failing which the results must of necessity be to some extent equivocal and subject to revision. However, it is possible by careful enquiry, to determine the origin of the materials in a given straw paper, or other straw product, with considerable certainty. -A. P. -C.

A-3 Suitability of Bamboo as a Paper Making Material. Paper, xxix, 17-18, (Sept. 21, 1921). According to Raitt, at a moderate estimate, the bamboo which is available under **possible** manufacturing conditions in Burma, Bengal, and South-West India could produce 10,000,000 t. of pulp annually, and the Savannah grasses in Assam about 3,000,000. R. A. Horsburgh states that the difficulty is to get the bamboos from a suitable site. -A. P. -C.

A-4, A-5. The Personal Equation in Moisture Testing of Pulp. T. LINSEY CROSSLEY. **Pulp and Paper,** xix, 1040, (Oct. 6, 1921). Most of the troubles which have arisen in moisture testing can probably be traced to the fact that the work was left in the hands of unqualified persons. The form of test that can be made in the simplest and quickest way and get correct results in the shortest time should be the aim. Referee tests should be made only by individuals having certain qualifications, among which should be included that of actual experience in mills. They should take into account all the circumstance of the case, and should not be bound by a method which is standardized in all its details and may not be strictly applicable in certain cases. Examples are given showing how lack of mill experience or lack of consideration of all the circumstances of the test may lead to serious errors. -A. P. -C.

A-14 The Strength of Hand Made Paper Samples. T.E. BLASWEILER. **Papierfabr.,** xx, 193-197, (Feb. 19, 1922). The suitability of fibrous materials for various purposes can be determined otherwise than by making large scale tests on the paper machine. A sample containing 25 to 50 g. of air-dry pulp is placed in a suitable container where it can be stirred and mixed with any desired material, sized, loaded, colored, or subjected to other treatment. A sheet of suitable size is prepared from the mixture, and can then be subjected to pressure tests, impregnation, parchmentizing, coating, etc. It is claimed that this arrangement is particularly suited to making sizing, loading, and coloring experiments. The hand made sheet can be compared with the machine made paper produced under the same conditions of sizing, loading, coloring, etc. In most cases the strength of the hand made paper was lower than that of the corresponding machine made paper. -I. G.

A-14 K-1 The Determination of the Sizing Quality. F. T. CARSON. **Paper Trade J.,** lxxiv, No. 14, 43-49, (April 6, 1922). The different methods used in the determination of the sizing quality of paper were investigated and their value is discussed. Okell's electrolytic method is examined in some detail. A new method has been evolved, based on the following principle, which has not been used heretofore: A small piece of paper, when floated on the surface of the water, will curl up into a cylindrical form with the machine direction as the axis. After maximum curling has taken place the sample begins to unfold. The time taken for this maximum curling to take place is remarkably uniform for the same paper under the same conditions. An explanation of this phenomenon is suggested, connecting it with the sizing quality of the paper and showing how it can be used as a measure of the degree of sizing. The method is applicable to all grades of paper from a good newsprint to the finest bonds, but is not suited to those papers which are so thick as to render the degree of curl comparatively small. The method affords a numerical value for relative sizing quality, the apparatus required is simple, and the test takes but little time. -I. G.

B.— Forestry

B-9 Canada Against the Export of Unmanufactured Pulp Wood. Paper Trade J., lxxiv, No. 17, 18-19, (April 27, 1922). The movement is said to be gaining momentum. The agitation for the enactment of laws to prevent the exportation of pulp wood from Canada is widespread. The principle behind the movement is that the prohibition of such exports will tend to encourage the growth of the domestic paper industry and help to etablish new paper mills in Canada. The buying up of whole sections of woodlands by American interests for conversion into pulp wood is held to be detrimental to local industries. -I. G.

C.— Wood Preparing and Equipment

C-8 A New Idea in Chip Breaking. A. D. WOOD. **Paper Trade J.,** lxxiv, No. 17, 46-47, (April 27, 1922). Two general methods of treating chips are in vogue in American pulp mills. In one case all the chips are sent through a breaker, then screened, the sawdust being discarded and the rejects given further treatment with rechippers. In the other process the entire product of the chipper is sent to the screen and only the rejects to the rechipper. The problem was how to break the chips to suitable size without increasing sawdust loss. The breaker is provided with spikes on its face. (See next abstract.) -I. G.

C-8 Chip Breaker. U. S. A. Patent 1,414,914, A. D. WOOD, L. TRANTHAM and E. T. SELF, May 2, 1922. **(Compare preceding abstract.)** A breaker head provided with sharpened spurs or prongs is placed just behind the chipper disc and in the path of the chips. The large chips from the chipper are impaled and broken by the prongs. The breaker is preferably rotated to increase its efficiency. -A. P. -C.

D.—Mechanical Pulp Manufacture and Equipment

D-4 Importance of Seasoning Pulp Stones. Paper, xxix, 26, (Sept. 7, 1921). A brief explanation of the importance of the proper seasoning of pulp stones, with a brief description of the characteristics of a good pulp stone. -A. P. -C.

D-0 E-0 K-0 Water Used in Pulp and Paper Making. ARTHUR S. M. KLEIN. **Paper,** xxix, No. 11, 12-13, (Nov. 16, 1921). Figures (many of them taken from the personal experience of the writer) are given for the water consumption of sulphite, groundwood, and paper mills operating under various conditions. The waste water from paper mills should not contain more than 0.006 per cent. of fiber, calculated on the gross effluent of the mill. In a given mill Klein obtained an effluent containing about 0.005 per cent. -A. P. -C.

E.— Sulphite Manufacture and Equipment

E-2 Utilization of Sulphite Waste Liquors. Ger. Patent No. 341, 690, L. STEIN, According to the principal patent (Ger. Patent 339, 741) and Ger. patent 340, 453, a gelatinous substance is added to the liquor in such an amount that only a partial precipitation of the lignin and tannin takes place in the form of a fine suspension. As has been demonstrated by actual experiments, still further quantities of gelatinous materials can be added to the liquor obtained in this manner, without causing precipitation of the lignin, provided substances such as various forms of starch, gum arabic, etc., are also added. The products obtained in this manner are ueful not only as sizing materials, dressings, etc., but also as adhesives.-I. G.

E-2 Removing Sulphur Dioxide from Sulphite Waste Liquor. Ger. Patent No. 345, 774, ZELLSTOFFFABRIK WALDHOF and H. CLEMM. The sulphur dioxide is absorbed by allowing the liquor to remain in contact with finely divided wood or other cellulosic material before mentralization. Chips intended for the manufacture of pulp can be used for this purpose. -I. G.

E-2 Combustion of Sulphite Waste Liquors. E. WIRTH. **Papierfabr.,** xx, 65-71, (1922). The dry material in sulphite waste liquor has an average calorific value of 4400 calories on a 10 per cent ash basis. This figure can vary owing to the fact that the treatment of the liquors may introduce larger quantities of ash. The net calorific value of the liquor itself at any concentration may be calculated from this figure by deducting the total heat required to evaporate the water present in the liquor. When the concentration of solids in the liquor is 12.5 percent., this figure is zero, and it is of no practical importance for concentrations below 40 per cent. The concentrated liquor must be burned with the aid of a coal fire. Tests in a boiler furnace indicated 80 per cent efficiency for liquor contaning 15 per cent of water and 70 per cent. for liquor containing 56 per cent. of water. The acidity of the concentrated liquor requires 6g. of caustic soda for neutralization. The most economical method of neutralizing is to add to the thin liquor, containing 11 per cent. solids, 3.75 kilos of chalk, 2.1 kilos of quicklime per cubic meter, with a trace of caustic soda. Before passing the liquor to the evaporators, the sludge should be separated. As soduim sulphite corrodes the evaporator, it should be oxidized by passing air through the liquor. The evaporation is conducted with the aid of a "heat pump", which is designed especially for the separation of the calcium sulphate from the self cleaning heating surfaces. About 285 liters of original waste liquor are required to produce a quantity of liquid fuel which contains 30 per cent of water and which can give 100,000 calories of effective heat in the boiler furnace. The quantity that must be evaporated is 256 kilos for which the consumption of power is 7 kilowatt hours, or 7. 6 h.p. hours. The hot thick liquor that is produced in the evaporator is fed directly to the boiler furnace without any special arrangement. One man can run the neutralizing and evaporating plant. -I. G.

E-2 Utilization of Sulphite Waste Liquor. Ger. Patent No. 343, 140, L. STEIN. Addition to Ger. patent No. 341, 690. Sulphite waste liquors which have been treated so as to yield products which are used in the dressing and finishing of textiles may be mixed with various substances which improve the value of the products for these purposes. Such substances as starch, gum or gum tragacanth, mixed with glue or other gelatinous substances can be used. Much better results are secured in this manner. -I. G.

E-2 Sulphurous Gases from Sulphite Waste Liquors. Ger. Patent No. 350, 155, G. LEUCHS and EISENWERKE GESELLSCHAFT MAXIMILIANSHUETTE, March 3, 1922. The sulphite waste liquor, either dried or in the liquid condition, is mixed with sulphates such as kieserite, kainite, etc. -I. G.

E-5 Process for the Preparation of a Pure Cellulose. Ger. Patents Nos. 366, 535 and 337, 768, AKTIEN GESELLSCHAFT FUR ZELLSTOFF UND PAPIER-FABRIKATION. The patent covers a process for the production of a very pure form of cellulose with a fiber that resembles that of cotton or wool. This cellulose is extracted from vegetable materials by the sulphite process. The sulphite liquor is mixed with organic acids or their salts, or both, **e.g.**, acetic acid or sodium formate. It is also advisable to add mineral acids. The operation is carried out in two or three stages. In the first place the material is treated with the usual sulphite liquor, then with mixtures made as above. A final treatment

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PULP AND PAPER NEWS

The Thompson-Starrett Company, Limited, New York and Montreal, have been awarded the contract for the construction of the plant of the St. Lawrence Paper Mills, Limited, Three Rivers, P.Q. The plant will consist of a groundwood mill and a paper mill. It will have a capacity of 150 tons of newsprint per day.

Mr. Thomas McDougall, a director of the St. Maurice Paper Company, Limited, died in Montreal, on June 7, aged 81. He was also chairman of the board of directors of the Shawinigan Water and Power Company.

The relation of railway rates to pulp and lumber have been mentioned in the inquiry into the Crown's Nest Pass agreement conducted by the House of Commons Committee on Transportation Costs. The Hon. K. E. Finn, representing the Maritime Provinces pointed out that the deflation in the pulp and lumber industries and the financial havoc suffered through the loss of the European and American markets had rendered those interests in the Maritime Province as desperate as that of any industrial or commercial interest in Canada. Mr. W. B. Lanigan, the freight manager of the C. P. R., in reviewing the evidence of other witnesses, advocated an immediate reduction on the basic commodities constituting the rough products of the forests, the mine, the field and the sea, wherever these products form the staple source of production and employment. In the forest products he included pulp wood.

With a view of facilitating the transportation of pulpwood, the Abitibi Power and Paper Company will construct a logging railway about 16 miles long from the mill at Iroquois Falls to connect with the Transcontinental Railway. The line, which will run in a northerly direction, will have the necessary spurs to various parts of the limits. The company will thus be in a position to use the lines in the winter and the rivers in the summer for the transportation of its pulpwood, giving facilities for a continuous supply of its raw product to the mill. This will obviate the necessity of keeping an enormous stock in the wood pile, as the wood can be obtained as it is required.

The Montreal Paper Club will discontinue its meetings during the summer. Arrangements are being made for a picnic, which will take the form of a visit to one of the paper mills in the province.

A. G. Pounsford of the Port Arthur Division, Provincial Paper Mills, seen in Toronto recently, advises that good progress is being made with the new book mill of that company in Port Arthur.

We are advised that the Harland Engineering Co. Ltd., have been awarded contracts for Harland Patent Interlock sectional electric drives for the new machines ordered by the Belgian Industrial Co. and by the Provincial Paper Mills. The former is a 230 new machines requiring 7 section driving motors and a speed range of 600 to 750 ft. The second is a 146″ book paper machine with 8 section motors and a speed range of 100 to 500 ft.

It is reported that Dryden Pulp and Paper Co. has ordered a Yankee machine from Beloit Iron Works.

FOREST NOTES IN ONTARIO

Ontario forestry services are to operate this year in the district north of Cochrane towards James Bay on the line of railroad extending into this area.

The work will consist largely of surveys and will be carried on with the aid of two hydroplanes, making their headquarters on Lake Remi, a short distance west of Cochrane.

The country is fairly dry and fire ranging will be as intensive as possible. The bud worm does not as yet constitute a factor in the Ontario fire situation, but is found to be coming in on the north east from Quebec, being now in evidence in the Temagami district.

At Convocation, June 9th, at the University of Toronto eleven graduates of the Faculty of Forestry received the degree of Bachelor of Science in Forestry. These men with about forty undergraduates will be engaged this summer, chiefly in survey work, partly under the Ontario Forestry Branch and partly under the Dominion Forestry Branch, one having entered the services of a private pulp concern.

PULP MEN DESIRE FREIGHT RATE CUT

Manufacturers of Pulp and paper in Canada have gone on record, through the Canadian Pulp and Paper Association, in favor of a general reduction in freight rates. Their statement, filed with the Select Committee of Parliament now dealing with the problem, favors a reversion to the rates that were prevalent prior to September 13, 1920, which, it is declared, would still allow the railways to charge rates approximately 42 per cent. above those in effect before the war. The association is also strongly opposed to limiting any reduction in rates so called "basic commodities," holding that this would be inadequate to meet the situation. They say, furthermore, that the present railway rates are driving the manufacturers, wherever possible, to ship paper by water instead of rail and point out that they are forced to this alternative owing to the fact that their European competitors can lay down shipments at Eastern United States ports at a differential of from $4 to $5 a ton as compared with all-rail charges from Canadian mills to the same points.

The association supports its petition with a statement setting forth:

"1 — That the present high rates are unwarranted by the existing economic conditions and constitute an intolerable drag upon industry and trade in general and upon the industry represented by this association in particular.

"2 — That in order to conform to the now prevailing conditions, the pulp and paper manufacturers of Canada have been obliged to reduce the average selling price of their manufactured products by over 54 per cent. as compared with the selling prices obtaining in September, 1920.

"3 — That in bringing about these reductions, the value of raw materials purchased on a high market have been written down to conform to present values, which range from 10 per cent. to 69 per cent., and averages 42 per cent. below those of the peak period.

"4 — That conditions in the industry have forced a reduction in the wages paid to labor, amounting, in some instances, to as much as 37.9 per cent. compared with the rates prevailing in September, 1920.

"5 — That notwithstanding a gross reduction of over

38 per cent. thus achieved in production costs, the percentage of such costs as represented by freight charges on raw materials has increased from 11.26 per cent. in September , 1920, to 22.89 per cent. at the present time.

"6 — That despite these drastic reductions selling prices are of necessity still too high to permit a resumption of business on a normal basis owing to the excessive freight rates. The industry is subjected to keen competition from Europe, which, under existing conditions, it is impossible to meet, despite the most rigid economies within its control. The outstanding factor that stands in the way of further price readjustment is transportation costs.

"7 — That no good reason exists why railway earnings and railway wages should be held to be immune to the general economic conditions, but that, on the contrary, the railways should be required to reduce their costs in accordance with the universal practice, and that only when this is done will adequate relief be afforded to those industries now languishing because of excessive freight rates.

"8 — That the suggestion that reduction in freight charges, if any, should be limited in their application to a select list of so-called basic commodities, as proposed, would be altogether inadequate to afford the required relief as applied to the paper industry, because, while it would benefit to the extent that it would affect the cost of coal and pulpwood, it would still leave unaffected such commodities as woodpulp, limestone, lime, alum, sulphur, waste, rags, rosin, salt, bleaching powder and other commodities used extensively in the manufacture of our products and vitally affected by the present freight rates, as well as the finished products."

The statement concludes:

"We submit that it is obvious from the foregoing facts that, while our industry has been compelled to adjust production costs and selling prices to meet the necessities of the times, trasportation charges (one of the most important items entering into manufacuring costs) remain at substantially the peak level created by the war and the abnormal conditions which immediately followed.

"We believe it urgently necessary that freight rates in Canada should be restored to the basis prevalent prior to September 13, 1920, which, while wiping out the balance now remaining of the increase allowed the railways at that time, would still leave them on a basis of approximately 42 per cent. above the pre-war level."

In a supplementary letter to the committee the association urges that the question of a readjustment of general freight rates should be considered apart from the controversy over the Crow's Nest Pass agreement, taking the view that if the contract between the C. P. R. and the western provinces is found to be unworkable under present conditions, a compromise should be effected between the parties at issue without prejudice to the interests of the rest of the country.

LAKE OF THE WOODS CONTROL BILL PASSED

In the early morning of June 9th, Bill No. 261 respecting "The Lake of the Wood's Control Board" was passed in the Ontario Legislature. This Bill provides for a joint board of four engineers, appointed, two by the Federal and two by the Ontario Governments, whose duty it shall be to secure the most dependable and advantageous use of the waters of the Winnipeg and English Rivers. The powers of the Board cover the Lake of the Woods, Lac Seul, the Winnipeg and English Rivers and "such other waters of the watershed of the Winnipeg River" as it may be agreed to place under their jurisdiction, excepting dams and regultating works extending across the International Boundary and the works at Kettle Falls.

Penalties in addition to legal proceedings are provided, fines not to exceed $1000 or imprisonment for three months, or both, may be imposed on summary conviction, and a further penalty up to $500 for each day of duration of offence.

The board is to have full powers and its rulings are to be accepted by the Exchequer Court of Canada and the Supreme Court of Ontario. It will have power to "enter upon and take such complete or partial possession of" mills, works or premises as it may deem necessary at the expense of the offending party.

The Act will come into force upon repeal by Federal Parliament of the Lake of the Woods Regulation Act 1921, Statutes of Canada 192, Chapter 38.

THREE RIVERS A PAPER METROPOLIS

Early in July the new newsprint mill of the St. Maurice Lumber Company (a subsidiary of the International Paper Co. of New York) at Three Rivers, Que., will bring its fourth paper machine into operation and will then constitute one of the largest single paper mills on the North American continent, with a newsprint capacity of approximately 240 tons a day. The mill is also equipped with a wrapping machine capable of turning out 30 tons a day and has an excess pulp production.

The St. Lawrence Paper Mills, Ltd., successors to the Three Rivers Pulp and Paper Co. Ltd., are breaking ground for a new mill at Three Rivers and have let a contract for two of the largest newsprint machines to the Dominion Engineering Company of Montreal. The first of these machines is expected to be in operation next November.

These developments, coupled with others already established or in contemplation, are destined, in the minds of some authorities, to make the Three Rivers district the greatest paper producing centre in Canada. With the Wayagamack Pulp and Paper Co., the St. Maurice Paper Co., and the International Paper Company already established and the St. Lawrence Paper Mills' plant under construction, the potential output of paper from this district early next year it is estimated will amount to 800 tons a day or 240,000 tons a year in addition to about 130,000 tons of pulp for the market.

The development owes its impetus to the large supply of pulpwood in the St. Maurice valley and to the availability of low cost electrical energy to a practically unlimited extent. The Shawinigan Water and Power Co., with its 326,200 h.p., supplies not only the mills mentioned but also those of the Belgian Industrial Co., at Shawinigan Falls, (now installing a new 85-ton paper machine), the Donnacona Paper Co., at Donnacona, and others.

Three Rivers as a result of the developments described, has become an object of great interest in pulp and paper circles and is attracting personal visits from engineers and experts from both Europe and the United States.

MEMORIAL MEDAL IN FORESTRY

Former students of the Faculty of Forestry of Toronto University have donated a medal in memory of George Bothwell a forestry student who served in the War and who was shot and killed by a German officer.

Thirteen other men of the Faculty of Forestry lost their lives on active service and it is hoped other medals will be given in their memory.

The Bothwell medal this year was awarded to Gordon Cosens, who is now workings in the forest surveys of the Laurentide Company, at Grand'Mère.

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may also be given by subjecting the material to the action of organic acids. This treatment yields a very pure cellulose free from all impurities. -I. G.

E-0 New Digester Equipment in Sulphite Mills. A.D. J. KUHN. **Wochbl. Papierfabr.,** lii, 3508-3513, (Nov. 29, 1921). New devices for charging chips into the digesters, for introducing the liquor, for blowing the digester are described. Diagrams are given of various new parts of digesters, such as acid level glass, outlet for the ued liquor, arrangement for taking a sample of the pulp in the digester during the cook, etc. -I. G.

F.— Soda and Sulphate Manufacture and Equipment

F-2 Dry Distillation of Evaporated Pulp Waste Liquors. Ger. Patent No. 344,609, E. L. RINMAN. Also Can. Patent No. 189, 656, April 15, 1919. The distillation is carried out in the presence of strong bases and of superheated steam. At the start the temperature is kept below 200 degrees Centigrade to drive out the major part of the water; then the temperature is raised to between 200 and 300 degrees until most of the methyl alcohol has been evolved; and finally it is raised to 300 to 500 degrees at which temperature acetone is produced and distilled. -I. G.

F-2 Utilization of Sulphate Waste Liquors. Ger. Patent No. 343, 954, L. STEIN The concentrated liquor, at a density of 34 to 37 degrees Beaume, is mixed with a solution of rosin, oil,etc., in a volatile, inert solvent such as benzine, benzol, carbon tetrachloride, etc. Only a small amount of these solutions need be used, and the mixture is agitated until an emulsified mass is obtained. A good adhesive composition can be made from nine parts of the concentrated liquor and one part of a solution of rosin in benzine. A very effective dressing preparation is produced from nine parts of the liquor and one part of a solution of oil in benzol. A tanning agent can be prepared by kneading together nine parts of the liquor and one part of oil dissolved in benzine. This mass must be diluted with water before using. -I. G.

F-0 Process for the Preparation of Pulp. Ger. Patent No. 349, 880, E. OPFERMANN. Straw, reeds, flax, broom, esparto, and other similar cellulosic materials are treated with caustic or carbonated alkalies or with the oxide and hydroxides of the alkaline earths, in as concentrated solutions as possible, in edge runners, stamping machines, or refining engines, the solutions acting during the comminution of the mass. The advantage of the method rests in the fact that the decomposition of the cellulosic material can be carried out to any desired point with a minimum consumption of chemicals. The presence of large amounts of water reduces effectiveness of the chemical solutions, and while the ordinary process requires the aid of heat and pressure, the present process can be carried out in the cold without the need of expensive machinery. In addition, the liquor that is recovered from the first decomposition treatment can be readily used for subsequent treatments, and when its concentration is reduced too low for the purpose it can be very easily re-concentrated and regenerated by the addition of more chemicals. -I.-G.

H.— Bleaching, Bleach Manufacturing and Equipment

H-4 Producing Bleach Liquor with Liquid Chlorine in the Pulp and Paper Mill. S. W. JACOBS and H. P. WELLS, Electro Bleaching Gas Co., New York. **Paper Trade J.,** lxxiv, No. 16, 41-47, (April 20, 1922); **Paper Ind.,** iv, 100-117, (April 1922). A discussion of the adaptation of liquid chlorine to the bleaching of those fibers which do not respond to an acid bleach, or where because of the large quantities of chlorine required to carry it in solution in water is impractical. The bleaching agent is calcium hypochlorite, prepared by the action of chlorine gas on high calcium lime. The product is of the same chemical composition as the solution prepared from dry bleaching powder, but differs markedly in some of its physical qualities. Chlorine passes up through a tower down which milk of lime is allowed to flow, the tower being packed with rings to afford as large a surface as possible for absorption. The solution, after passing down the tower, flows into a circulation tank where it is kept agitated and from which it is pumped back to the top of the tower and allowed to flow down again. When the solution is of the required strength, the bleach liquor is pumped from the circulation tank to a storage tank. A description is given of the specially designed bleach plant built at the Lincoln Paper Mills, Merritton, Ont., for the preparation of bleach by this process. Detailed results are given of operating tests showing an absorption efficiency of practically 100 per cent, an availability of the absorbed chlorine of 99.17 per cent., a maximum of 0.131 per cent of the aborbed chlorine converted to chlorate, loss of 0.31 per cent in sludge, a requirement of 1,052 pounds of lime per 1,000 pounds of chlorine, and an alkalinity of the finished bleach equal to 1 gram of lime per liter. The advantages of the system are discussed. -I. G.

H-5 Alkaline and Acid Bleaching. HOTTENROTH. **Wochbl. Papierfabr.,** lii, 3784-3789, (Nov. 11, 1921). The rapid bleaching action on litmus coloring matters, which is obtained with a cold, acid solution of bleaching powder, is not obtained with a hot, alkaline solution With equal consumptions of chlorine, the same bleaching action is not secured on cellulose with a cold acid bleach liquor as with a warm one. Cellulose bleached in liquor acidified with carbon dioxide shows an increase in the copper number, in spite of the fact that the whiteness of the pulp is not so pronounced, as compered with cellulose bleached in a warm alkaline solution. This copper corresponds approximately to the increase caused by sulphuric acid under conditions of equal acidity. The most effective bleaching action is obtained with the use of carbon dioxide when the solution is acidified to such a degree that the bleaching action of the bath remains effective as long as possible during the process. Less chlorine is consumed in bleaching tests made first with acid and then with alkaline bleaches than in either the acid or alkaline bleach used alone. The alkaline bleach followed by the acid bleach does not yield the same result. The best practice is to allow about two-thirds to three-quarters of the chlorine consumed in the bleaching process to act in acid solution, and the remainder in the alkaline solution. -I. G.

K.— Paper Manufacturing and Equipment

K-7 Furnishing Beaters. Papierfabr., xx, 6-8, (Jan. 8, 1922). The various apparatus used in furnishing beaters are described in detail as regards both operation and construction. The various measuring devices used are also explained in detail. -I. G.

K-7 Beater. Ger. Patent No. 342, 772, GRILEY-UNKLE ENGINEERING CO. In the trough there is a sorting device by means of which the material which has not become properly loosened up can be removed periodically. It consists of a shaft with pickers which can swing out diagonally across the direction of flow of the stock and which automatically remains fixed in each of the positions in which it is placed. -I. G.

NEW BRUNSWICK NEWS

The Nashwaak Pulp and Paper Company's mill at St. John is now being operated after a short suspension of activity. Hugh Chisholm of Portland, Me., the president of the company recently made a tour of inspection accompanied by N. M. Jones, the general manager. Sydney Jones, son of N. M. Jones, is now the manager of the mill at St. John. N. M. Jones is now spending most of his time in New York City, since his promotion from manager of the St. John mill to general manager of the company.

While Mr. Chisholm was on his tour of inspection, the site of the proposed mill at Nashwaak, near Marysville, was carefully gone ever. The company has purchased six acres of land as a site for the mill, the site being in close proximity to the extensive pulp wood holdings of the company, on the Nashwaak and the Miramichi rivers. The officials of the company have decided to let the matter of the new mill lie in abeyance until the early fall at least. It may be that the construction of the mill will not be started until next spring.

The mill at Woodland of the St. Croix Pulp and Paper Company is being operated but the paper bag factory in connection has been idle for some months. Labor trouble is the cause. The mill at Woodland is a large mill, and is easily the biggest industry along the St. John river on both sides of the international line.

The New York World Publishing Company which now has control of the pulp mill at St. George has instituted a number of improvements since it purchased the majority of stock in the company. A new power plant building has been projected and may be started in the late summer. The mill has been working steadily since it was changed in ownership.

The Fraser Companies Limited have not dropped the plan to build a pulp and paper mill on the Tobique river near the junction of that river with the St. John river. Owing to the present stringency in the financial situation this project has not been furthered. Objections to the proposed mill have been entered with the New Brunswick government by salmon fishermen. The Tobique Fishing Club contends that the construction of a dam across the Tobique near the mouth of the tributary of the St. John river would destroy the salmon fishing for which the Tobique has for many years been noted. It is argued that the salmon from the St. John river would be unable to cross the dam, whether or not a special sluiceway was installed. On the contrary the Fraser Companies Limited claim the salmon fishing would not be materially injured. Mention has been made by spokesmen of the big lumbering corporation that about two hundred and fifty men would be employed at the mill, and possibly three hundred.

The Bathurst Lumber Company's pulp and paper mill at Bathurst is working steadily. Angus McLean, the president, looks forward to a prosperous season. He expects no labor troubles at the mill and if they arise he will meet them in a conciliatory spirit but he says he will not be dictated to by union officials from outside.

The paper mill at Bear River of the Clarke Brothers Company, Limited, which has been closed during the financial difficulties of the company, has been reopened now that an agreement has been reached among the creditors and stockholders. However, the factory at St. John manufacturing fibre ware, paper boxes, corrugated paper, cardboard, etc., has not yet resumed operations. The steamer, Bear River, owned by the company and operating between Bear River and St. John has not missed a trip.

The Pejepscot Pulp and Paper Company of Brunswick, Maine, which has extensive pulp land holdings in St. John county, has been transporting large quantities of pulpwood from Salmon River to Bath by barge, with tow. The company is considering the construction of a pulp and paper mill at Salmon River, but not until the labor cost has been effectively reduced.

The International Pulp and Paper Company of New York City, which concern has the lease of the water power privileges at Grand Falls, and was scheduled to construct a pulp and paper mill there may construct a hydro-electric station instead. Philip Dodge, of New York, the president of the company, recently inspected the site. The intention is to sell the current to the towns on both sides of the international boundary, there being twenty Maine and New Brunswick towns within a radius of fifteen miles from Grand Falls, which is only two miles from the Maine line.

PERMITS BOUND TO BE A BENEFIT

The closing of the forests to the public by the Quebec Government, just put into effect, owing to extensive forest fires, was under discussion at the conference of the Forest Protective Associations of the Province of Quebec, held in the early part of the year at the Windsor Hotel, Montreal. Mr. R. P. Kernan, of the Donnacona Paper Company, Limited, Quebec, the chairman of the Woodlands section of the Canadian Pulp and Paper Association, read an exhaustive paper on the subject, dealing with it from a legal as well as a forestry point of view. He argued that this control was necessary in order to minimise the forest fires, and that the regulation of entry into the Crown lands should take the form of a system of permits, somewhat on the lines of the system which the Quebec Government has now adopted. In Mr. Kernan's opinion, concurred in by many officials of the fire protective associations, permits will have an excellent moral effect on those to whom they are issued. In the first place the permit calls attention to the fact that there is great danger from fires if carelessly lighted or left behind; in the second place the holders of the permit will appreciate that his presence in a certain place is known and that this fact will cause him to assume a certain amount of responsibility for his conduct; and in the third place, the ranger who issues the permits will know where people are located in his territory and will, in consequence, be able to guard more carefully the points where there is the greater danger because of occupation.

Mr. Kernan also pointed out the enormous damage to our forests caused by carelessness and that it was essential that nothing should be omitted to cut down the losses which occur year after year.

RAPID RECOVERY AT DON VALLEY MILL

The work of clearing up debris at the plant of the Don Valley Paper Mills has proceeded very rapidly since the serious fire of two weeks ago, and reconstruction work is being commenced. A temporary roof is being placed on the boiler house. The beater room, where perhaps the worst damage was done, is now clear of obstructions and arrangements are being made for roof and floors.

Work has begun on the Abitibi Railroad, from Iroquois Falls to Hughes, on the Transcontinental. The constructions are the Wheaton McLean interests of Toronto. The road is to be in order for running on Nov. 1. The inspection of material and work will be in the hands of Mr. Crombie of the Forestry Dept.

Be not disturbed by infidelity. Religion cannot pass away. The smoke of a little straw may hide the stars, but the stars are there and will re-appear. —**Carlyle.**

The Markets

CANADIAN TRADE CONDITIONS

Montreal, June 13.—In a general way, the paper and pulp trades may be described as fairly active. There is no rush of business, but as a rule, the orders are coming in a satisfactory rate. The summer time is generally dull in most departments of commerce; so far the paper industry has not felt this condition. The tendency has been rather in the other direction, in one or two sections the improvement has been pronounced. As against this, competition in two or three lines has becomes more keen; Here American paper makers are quoting prices which are away under cost, and are meeting any reductions by Canadian mills by still more drastic cuts. It is almost impossible to find a remedy for this condition. We have an anti-dumping law, but those who invoke its aid will find that the delays are so numerous as to make the Act next to useless.

Newsprint mills state that they are exceptionally busy. More orders could be obtained if the paper could be turned out. The prospects are that the mills will have a steady business until the end of the year, and that the price will be maintained at its present level. Some shipments for New York are being sent from Quebec by barge, on account of the high rail rates.

The fine and book papers command a fair sale; tissues and toilets are rather quiet; boards are slow. Although kraft wrappings are not as active as they were, the Wayagamack mills are quite busy, being partly engaged on making specialty papers. There is a continued brisk demand for roofing papers, while in rags it looks as if shirt cuttings will go higher. The following are the prices of roofing felts and sheathings: sheathing, $0.65 to $1.15 per roll; tarred sheathing $0.85 to $1.20; white sheathing, $5.50 per 100 lbs; grey sheathing, $4.50; straw sheathing, $3.15 per 100 lbs; ditto, tarred, $3.40; carpet belt, $3.90 per 100 lbs; tarred felt, heavy $7.10 and 16 oz. $3.45.

The export demand is better, and a number of shipments of the better class papers is going to Australasia. The competition for this business is exceptionally strong, Great Britain putting up a strenuous fight for the trade.

Apart from the increased call for bleached sulphite, the pulp market is nothing to boast about. European countries are still actually going after the business in the States, and are exporting considerable quantities of unbleached, while Canada is getting a good share of the unbleached description.

While the present condition of the pulp wood market is practically lifeless, there are indications that there will be a decided change before many months are passed, and with it, there should be an improvement in pulp. The large stocks of pulpwood are being rapidly worked off; little wood has been taken out of the forest this year; and the forest fires are likely to have an influence on prices, as many of the areas which have suffered had been mapped out for early cutting. These are the points which will probably result in prices advancing, for directly there is a sign of a demand quotations will certainly take an upward turn.

Toronto Topics

Steady improvement is reported from so many directions that it seems safe to say that business after getting out of its depths is now finding a solid footing. Retail trade in Central Ontario is more active and seems better balanced as between urban and rural centres.

Crop and fruit conditions are in most cases almost ideal in spite of the heavy rains of June 10th and 11th.

Some financial and business leaders have thought it wise to state that endeavours to intensify sales conditions to more boom-like proportions should not be encouraged. Every advance should be soundly consolidated and business should be characterized by spontaneity.

Efforts are being made in several lines of business, both construction and manufacturing, to secure more even merchandizing conditions throughout the year and avoid alternation of expensive rush conditions and depressing slumps.

It is being felt more and more that trade is returning to circumstances wherein local or national factors will cease to determine progress and further notable advances can only come from improved export conditions.

Market Notes

Prices of Pulps remain unchanged with a firm tendency and better demand.

Groundwood, deliered, $30 to $35.

Sulphite delivered, Book about $60, News around $65, Bleached $80 to $90.

Sulphate, delivered, $70.

Book and Writing market shows little variation but there is a tendency to more activity.

Board market is active and mills busy.

WRAPPINGS show improvement, both in volume and number of orders.

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TOILETS. Car Lots List price Less 20 p.c. and 25 p.c.

PAPER STOCK.—

No. 1 Hard White Shavings	$3.75	
No. 1 Soft White Shavings	3.25	
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Ledgers and Writings	1.95	
No. 1 Kraft	2.25	
Newspapers	.80	
No. 1 Mixed Papers	.60	
No. 1 Miscellaneous	.55	
No. 2 Miscellaneous	.50	
Roofing Rags	25.00 per ton	
No. 1 White Shirt Cuttings	10—10¼	In fair demand
Canton Flannels Bleached	7	
Canton Shirt Cuttings	7	
White Lawns	6¼— 7	
Blue Overall Cuttings	5 —5¼	

ROPES and BAGGING.—

No. 1 Scrap Bagging	
No. 1 Manila Rope	5 — 5½

NEW YORK MARKETS

New York, June 10.—(Special Correspondence).—While it is true that a little slowing down of demand for some kinds of paper in some quarters is perceptible, the general market situation in New York, and, according to reports, in various other parts of the United States, continues firm with enough business transpiring to give the situation a lively complexion. There is no question but that most kinds of paper are moving in much larger tonnage than a few months ago, and the entire industry is characterized by a healthy and steady undertone, with indications pointing toward a further increase in trade activity in the not distant future. It is, of course, a seasonable matter for consumers of paper to let up in their buying to an extent at just this time of the year, and it is not surprising therefore that the orders received during the past few days by mills and jobbers have not been for quite as large quantities of paper, but most manufacturers and dealers have ample business booked together with the regular current purchasing done by paper users to keep them well engaged.

Newsprint is in a position by itself at present. Demand for print paper has not diminished one whit, instead there seems to be a gradual increasing call for newsprint from publishers, who are consuming paper in tonnage very nearly equalling that consumed even in the abnormal period of boom business conditions following the late war and who are kept more or less all the time in the market as buyers of newsprint. Frequently reports drift in of this or that print paper mill increasing its production either through the placing in operation of some machine that has been idle for some time past or else by speeding up their equipment otherwise. Moreover, newsprint is moving out of mills just about as rapidly as it becomes available, and there is plenty of proof that publishers are using up supplies as soon as they are received from mills. Department stores are advertising in the daily newspapers to a very large extent at present, and other advertising is showing a steady increase, with the result publishers are printing large issues, and are circulating a great many more copies than they were not so long ago.

Prices on newsprint are firm. Foreign competition is an almost unknown quantity under prevailing circumstances because such paper as is being imported is so readily absorbed that it has little or no influence on the domestic market, and publishers are more and more going back to domestic and Canadian manufacturers to fill their paper requirements. There is a good deal of discussion in the trade over the probability of an increase in prices on newsprint later in the year. It seems that manufacturers are opposed to any advance in prices, evidently feeling that now that prices are so well stabilized it is best for all concerned to let them remain where they are, but dealers in a good many instances express the opinion that a rise in print paper quotations for the fourth quarter of the year is not beyond the realms of possibility by any means, some even going so far as to make the prediction that should demand keep up at present proportions prices will be advanced.

The situation in fine papers is steadily improving and is one of the most encouraging features of the industry at present. Fine papers are considered a wonderful barometer of general business conditions, as when business concerns are busy they use more stationery in the writing of correspondence and in the preparation of advertising matter and with demand for fine papers constantly broadening it is felt that business generally is on the mend. Prices on bonds and ledgers are gradually firming. With mills favored with more orders and with production costs on the rise owing to increases in prices of raw materials, manufacturers are repeatedly readjusting quotations without disturbing the market in the least.

Coarse papers are in fair demand. There is much room for improvement but it is customary for consumption of wrapping and tissue papers to ease off at this period of the year. Quotations are well maintained, however. There is a moderate movement of book papers and prices evince a stiffening tendency which seems to be a natural condition when it is considered most mills are selling book paper at prices which show them very little or no profit. Boards are in good demand and quotations also display a firmer tone Competition among board producers is still keen, however,

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AND

Finnish Wood Pulp Union
Helsingfors, Finland

and the eagerness to get orders serves to keep prices from reaching higher levels, and plain chip continues to be quoted at $32.50 to $35 per ton f.o.b. New York, and filled news board at $35 to $37.50 a ton.

GROUND WOOD.—A good routine movement of mechanical pulp is reported and prices seem to be holding their own; otherwise the market is devoid of feature with no change noted. Newsprint mills are buying groundwood freely and there is also a steady call for supplies from board plants, while other consumers are purchasing in just about their customary tonnage. Stocks are plentiful at present but producers are not pressing matters and seem satisfied to accumulate surplus holdings to help them out later in the summer when low mill streams invariably necessitate the curtailing of grinding operations. Around $31 per ton at domestic producing points is an average of quotations named on spruce groundwood for prompt shipment, with Canadian grinders reported quoting at from $27 a ton upward depending on their location and the freight involved from their points to consuming plants.

CHEMICAL PULP.—Orders for most kinds of chemical pulps are coming in fairly regularly and the market as a whole exhibits a moderately active tone. Paper manufacturers seem averse to buying other than to cover direct requirements, nevertheless there is enough purchasing to keep things moving, and prices on pulp certainly show a steadier position than in some time. Bleached sulphite is moving well at about 4.50 cents per pound f.o.b. domestic and Canadian mills for No. 1 pulp, and at from 4 cents upward ex dock New York for No. 1 foreign bleached sulphite. Kraft holds in price at around 2.65 cents a pound on the dock for Scandinavian kraft, and from 2.75 cents upward to 3 cents for No. 1 domestic kraft. There is not very much activity in soda pulp but quotations are maintained at around 3.50 cents.

RAGS.—The market for papermaking rags is firm. Demand for most grades is increasing and dealers are taking full advantage of ruling circumstances to mark up prices. Roofing rags are leading in the forward march of prices, and, as is usually the case, with satinets in demand and advancing, other grades of rags are improving their position. Felt paper mills are plainly anxious for rags. Not that they are so urgently in need that they are buying in a way to excite the market, but inquiry is quite brisk and dealers say they are occasioned no trouble in getting orders for roofing rags. Sales have been recorded at above $1 a hundred pounds f.o.b. dealers' shipping points for No. 1 roofing stock, and at 90 cents a hundred pounds and higher for No. 2 packing. Old whites are strengthening in price, with current quotations ranging around 5.25 cents for No. 1 repacked, 4.75 cents for No. 1 miscellaneous packing, and 1.50 cents for street soiled whites. Blues are quiet though sales are reported by dealers at 2 cents per pound for repacked, and 1.40 cents for rough packing of thirds and blues. New cuttings are firm, with No. 1 white shirt cuttings especially strong at 10 to 10.50 cents a pound at dealers' shipping points.

PAPER STOCK.—All grades of old paper are moving well and prices are firm. Low grades now appear to be having their inning and there has been proportionately a larger advance in prices on such grades than on the better quality descriptions this week. Folded newspapers have sold at 65 cents f.o.b. New York, No. 1 mixed papers at 50 cents, over issue newspapers at 90 cents, and city mixed papers at 40 cents a hundred pounds. Soft white shavings are firm with dealers refusing to consider offers at less than 3.50 cents per pound f.o.b. their shipping points, and old books and magazines are strongly quoted at 1.60 cents a pound. Kraft paper is selling at around 1.75 cents a pound at shipping points, and No. 1 hard white shavings at between 3.75 and 4 cents a pound, depending on the packing.

OLD ROPE AND STRINGS.—Old manila rope is probably the strongest item in the papermaking raw material trade at present. There is a brisk demand for rope and sales of No. 1 rope have been reported up to 6 cents per pound f.o.b. dealers' shipping points, though market quotations range down to about 5.62½ cents. Rope, from all appearances, is scarce, and consumers are in need of it, with the consequence high prices are being readily met. Old bagging is quiet, and prices, if anything, are easier.

TREE PLANTING IN DOMINION FORESTS

Planting trees and sowing tree seed in Dominion forest reserves is done for two purposes: first, to restock the area with some desirable species, which has become extinct or nearly extinct through repeated fires in years gone by; and second, to furnish data as to the best methods of planting and seeding, the rate of growth, etc. These experimental plantings were greatly increased during the year. Approximately 58,000 Scotch pine, jack pine, and white spruce seedlings and transplants were set out in twenty-seven plots aggregating about twenty acres. A large part of the planting stock was furnished from the Forest Nursery Station at Indian Head, Saskatchewan, and the remainder came from small nurseries established on various reserves. In addition to the above, nineteen experimental plots covering approximately twenty-five acres were sown with seventy pounds of tree seed, about evenly divided between white spruce and jack pine.—Annual Report, Director of Forestry, Ottawa.

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A New Underfeed Stoker

There is one type of industry which is insistent in its demands for steam in large quantities at uncertain periods, much in the same manner as a central station. We refer to the pulp and paper mill.

The underfeed stokers made by the MacLean Underfeed Stoker Co., Toronto are found to have some interesting features, the chief points being in the method of steam distribution to the ram and the form of tuyeres used in the grates.

The general arrangement of the stoker is of the usual underfeed type with a ram operated by steam, pushing the coal into the bottom of a trough, underneath the burning fuel. This process causes the gases in the fuel to be first distilled and ignited as they pass through the burning top layer of fuel, and after the gases are set free the remaining carbon is pushed up to the top of the fire, the ash and clinker being pushed over onto the side plates where they can be taken away at cleaning time.

In the underfeed type of stoker forced draft is a necessity, and the air is admitted to the fire through tuyeres placed at the side of the fuel trough. One of the features of the MacLean stoker is the construction of these tuyeres. The portion which is most susceptible to burning is made separate, but easily fitted into the main body of the tuyere. . It can thus be easily renewed, and it is also made in such a manner that the projections which guide the renewable portion into the base, also serve as a preventive of coal siftings dropping into the air chamber. The method of distributing the steam to the ram cylinders is one developed by the MacLean Underfeed Stoker, and differs from the method employed in other underfeed types quite considerably. The following description will make it clear.

Automatic Control

The automatic feed controlling system of the MacLean Underfeed Stoker is a positive yet simple means of governing the amount of coal delivered by the stoker to the furnace and the quantity of air supplied by the blower. It enables the operator to easily adjust and correctly proportion these to suit the class of coal used, and the demands for steam upon the boilers, so as to maintain automatically a constant uniform steam pressure under all conditions of load.

The speed of the steam engine or electric motor driving the blower is controlled by a steam pressure regulator which is set for any desired boiler pressure and is governed by the rise and fall of the pressure itself. Any variation in the speed of the blower is imparted to a reduction gear through a belt drive from a small pulley on the blower shaft, the oscillating motion set up by the reduction gear is carried by connecting rods to an adjustable ratchet operated timing valve which may be located on the boiler front or placed in any other convenient position in the boiler room. From the timing valve a small pipe leads to the main valve steam chest on the stoker cylinder. Fluid pressure is conveyed through this pipe with each rotation of the timing valve and actuates the main valve of the stoker which in turn controls the number of strokes of the piston operated ram and consequently the quantity of coal fed to the furnace.

Following the operation of the automatic control it will be seen that should the boiler pressure fall slightly below the desired point, the steam pressure regulator acts on the motive power driving the blower, increasing its speed, which thus delivers more air to the furnace for combustion. At the same time the speed of the reduction gear is increased, being driven by the blower. This increases the rate of the operation of the timing valve, which in turn controls the speed of the stoker ram and the delivery of coal to the furnace. It will thus be apparent that as the boiler pressure falls the rate of combustion is increased which immediately raises the boiler pressure again.

If the boiler pressure should rise above the desired point the steam pressure regulator will reduce the speed of the blower and the reverse of the above described operations will occur, resulting in the lowering of the rate of combustion in the furnace and the consequent falling of the boiler pressure. The variations of rise and fall of the boiler pressure necessary to alter the rate of the coal feed and air supply are so slight that the result is a practically continuous, even steam pressure.

Varying conditions of boiler loads and grades of coal used are easily taken care of. The adjustable ratchet permits the increasing or decreasing of the amount of coal fed through the stoker over a wide range, by setting the index lever so that the pawls take a greater or lesser number of teeth on the ratchet wheel at every oscillation. With this adjustment it is possible to vary the amount of coal without altering the speed of the blower and thus the ratio of coal to air can be proportioned to give efficient combustion. The index lever has eight positions of adjustment, also a zero position stopping the coal feed altogether. The timing valve may also be rotated by a small hand crank and in this way the stoker made to feed any desired number of charges of coal independently of the automatic operation. The design of the timing valve is such that a number of these may be operated together as a set by a single drive without interfering with the provision made for the individual control of the coal feed to each retort. This feature is of great advantage where several retorts are installed in the same furnace or under boilers of different sizes.

The main valve steam chest is cast integrally with the stoker cylinder and the main valve itself which is completely blanked off within the steam chest, operates close up to the cylinder bore making the ports for the admission of steam to the piston very short and direct, thereby reducing the cylinder clearance displacement to a minimum.

The arrangement, it will be seen, tends to great flexibility. The method of controlling the steam supply to the cylinders reduces clearance losses to a minimum, and also simplifies the mechanical parts necessary for operation.

ANDY KNEW HUMAN NATURE

Although he was poorer than the proverbial church mouse when he was a boy in Scotland, Andrew Carnegie knew human nature well enough to get what he wanted with his insignificant material assets.

One of his chief childhood enjoyments was the keeping of pigeons and rabbits. To secure food for these pets he needed help . He persuaded his boy friend to spend the Saturday holiday gathering dandelions and clover for his rabbits, the compensations being that the young rabbits, when such came, should be named after the boys who helped.

Later in life he said his conscience reproved him for driving such a bargain, but the truth was, he gave them the only reward at his disposal. He also said he treasured the remembrance of the plan as the earliest evidence of his organizing power.

Pulp and Paper Magazine
OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

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:-: EDITORIAL :-:

WHY WE DO IT

Some time ago, a reader of the Pulp and Paper Magazine asked why we print all the reading matter in the centre of the magazine and suggested that with the large number of articles which many readers doubtless want to file for reference, it would be advisable to print reading on one side of the page and advertising on the other side but remarks that the sales manager might not agree to such a change.

This is a question which has doubtless entered the minds of other readers and the editor would be glad to have an expression of opinion as to which arrangement is more convenient.

The advertising manager, curiously enough, appears to approve of the arrangement suggested by our correspondent. For our part we would like to point out that the editor takes particular care to have the articles so arranged in the magazine that items of only passing interest are printed on the back of a page containing material of technical or other nature that our readers may wish to preserve by tearing out and filing. On the other hand there are a number of readers who take out the centre of the magazine and bind it for reference. Obviously the plan suggested by our correspondent would just about double the volume of such a file.

"WE MUST HAVE FORESTS"

Under this heading the current number of "American Forestry" has an editorial lamenting the procrastination of Congress with regard to enacting legislation which would establish a definite constructive national forest pclicy for the United States. The delay is largely due to relatively minor differences as to details of a bill before the house committee on agriculture. We say minor differences of opinion because of our conviction that the need of immediate steps towards the conservation of the present timber supplies and the establishment of permanent forests is one of the most important public questions of the day. In fact President Harding, in a letter to the Union League Club, Chicago, wrote, "The problem of forest conservation, and of the most economic utilization of our forest resources, is now universally recognised as one of the most serious confronting the nation. Much progress has been made in the last few decades in dealing with it, but there is need for much further accomplishment."

The Union League Club has been doing notable service in promoting a realization in the middle west of the seriousness of the problem and the need for constructive action all over the country. Forestry associations and other organizations whose members find recreation or the raw material for their business in the forests are awakening to the need for better treatment of the trees. The ever-growing public sentiment which is being aroused by these organizations and the press should be headed by a strong national forest policy. Canada is very deeply interested in everything that is done to protect or to destroy the forests of the United States.

Failure at this time of the enactment of a progressive policy on the part of our neighbor is simply putting a heavier burden on our already severely taxed forest resources. We have an enormous problem of our own and it will be a long while before the measures which are instituted or considered even now, can result in the establishment of a forest which can support more than our own wood using industries. We have the fond and confident hope that there will come a day when our forests will be so productive that there will be wood for our use and to spare for all who may need it, the same as our rich prairies are capable of supplying bread to a large part of the world's population. To arrive at such a happy state, however, requires the immediate institution of every measure which will in some way, in some degree, contribute to the protection of our mature timber and the encouragement of reproduction, whether it be by natural means, by direct seeding or by replanting; there are places where each of these means is particularly adaptable.

The problem of the forest is not an isolated problem of either Canada or the United States but is a North American question. American forests are being rapidly cut out and to a large degree burned out as well as being destroyed by insects and other natural causes. The Canadian forests are being depleted with undue rapidity by wasteful logging methods, insufficient protection from fire and by ravages of natural enemies which could be largely minimized if not almost entirely prevented. Cooperative efforts have been successfully introduced for the efficient protection of birds where both countries are interested and we can see no reason why there should not be established a cooperative policy of forest management.

It is said that charity begins at home and also that the preacher should practice his own doctrine. In view of this it is highly desirable that Canada should be prepared for international cooperation in forest matters through having first inaugurated the fullest possible cooperation among the provinces and the Federal Government. A great deal has been accomplished by the different provinces and by the Federal Government with respect to crown lands but perfection is a long way off yet and to reach it will require crossing some private lands and possibly crossing swords with the owners. The serious result of the early dry spell this year has been a costly lesson to Quebec. New Brunswick fortunately had foreseen a difficult situation and prepared for it by providing for permits to those desiring to travel in the woods. We have not heard of any very serious fires in New Brunswick and with the enforcement of the recently established permit system in Quebec, we trust there will not be any more fires resulting from the carelessness of persons casually in the woods.

Keeping the fire out is very important but from our limited knowledge and somewhat more extensive study of the situation, it hardly seems reasonable to expect that nature will reproduce the forest as fast as our growing population and commercial development will require the wood. To expect this would be on par with a farmer expecting to get as good a crop next year from natural seeding of the occasional falling of grain as he will be sure to get from his field if he plants it. A meadow will not even reproduce continually a crop of hay of uniform quantity and quality; it has to be reseeded. There is evidently a similar reversion of forest crops but the product can be largely controlled by scientific forestry methods. The main thing, however, is to maintain forest productivity; as our contemporary says, "we must have forests". Let Canada and the United States see to it that our continent, at least, will never want for wood.

ROTTEN EGGS AND SULPHUR MATCHES

Sulphur matches are seldom met with nowadays although many woodsmen find them almost a necessity. The odor from a burning sulphur match, if inhaled in too strong a dose, is decidedly irritable but a faint whiff of it is not unpleasant. On the other hand, the odor of antiquated hen fruit is quite a different proposition.

A correspondent of *"Le Bien"* published at Three Rivers, is unduly worried over the matter of odors from the pulp and paper mill which is about to be constructed in that city. He has unfortunately confused the odor we have just referred to and the one of which we have considered it unnecessary to describe. The odor from a sulphite pulp mill in dry weather is barely noticeable if it can be detected at all. In wet weather or just prior to a storm, it is detectable by those on the lee side of the mill. It is a good weather prophet, a point which should be placed to its credit. At a very short distance from the plant, in fact even on the mill grounds, the very small amount of sulphur dioxide which gets away is so diluted as to have no serious effect on a person's olfactory organs or throat. In fact, having lived a number of years on a hill almost directly over a pulp mill, we can say that the correspondent of our contemporary has fears which are entirely unfounded and though he may be commended for his endeavor to protect his fellow citizens—and himself—from any unpleasantness which might be anticipated from the erection of the new mill at Three Rivers, we hasten to assure him that he has nothing to worry about.

CANADIANS MUST PAY FOR POWER

Mr. E. Beck, Secretary of the Canadian Pulp and Paper Association, corrects an erroneous impression in the following letter.

To the Editor of the Paper Trade Journal:

Sir: The editorial appearing in your issue of June 8th entitled "Water Power in Canada", intended, evidently, to provide an argument in support of a high tariff on importations of pulp and paper from Canada into the United States, gives a decidedly erroneous impression of the contrasting industrial conditions in the two countries. Admitting that it would not be becoming for an outsider to discuss another country's fiscal policy, which is purely a domestic concern it may perhaps be permissable to indicate wherein the inferences contained in the editorial appear to be at fault.

Your editorial speaks of the "many wonderfully large water powers, some of them running as high as 200,000 to 300,000 H. P." at the disposal of the pulp and paper mills in the region "north of Montreal, Quebec," the power from which costs the mills "practically nothing beyond the interest on cost of development."

The facts are that the total installation of hydraulic motive power for all Canada, not Quebec alone, employed in the operation of pulp and paper mills and their subsidiary industries, amounts to but 637,080 H.P. This includes all power derived from hydraulic sources, both direct and indirect. The amount of electrical energy derived from water-power so employed amounts to 339,488 H.P. Of the latter amount, the companies purchase from outside sources some 160,577 H.P., leaving 178,911 derivable from their own power installations. For the purchased power the companies pay the current market price, which, in most instances, varies but little from the cost of similar energy in the United States. But whether they buy their power or develop it themselves, it is incorrect to infer that it represents no greater cost to them than the interest on the cost of the development. Hydro-electric power costs, other things being equal, are very much the same in both countries.

The further inference that pulp and paper mill labor costs are considerably less in Canada than in the United States is similarly erroneous. International union wage scales and conditions apply to a majority of the mills in Canada, the same as in the United States. Expert labor comes higher here because much of it is derived from the United States and requires special inducements to persuade it to migrate to Canada.

If it were literally true, as asserted, that Canada's forehandedness in building dams and constructing extensive hydro-electric developments, taken with the States' alleged neglect to follow a similar course, gives the Dominion an undue advantage in the pulp and paper market as compared with the American producers, that fact would seem to constitute a reflection upon American enterprise rather than a basis for sympathy, were it not for the additional fact that much of the Canadian development of which complaint is made owes its existence to American initiative and the investment of American capital, the chief inducement being the more abundant raw materials to be found here, and that a large proportion of the resulting benefits flow across the border.

The question arises, should such capital be penalized merely because it is invested on the north instead of the south side of an imaginary line?

Edward Beck

Montreal, June 15, 1922.

The Use of Rotten and Stained Wood for Making Sulphite Pulp

By E. Sutermeister

Rotten Wood

Spruce wood which has been stored for any length of time is often found to be badly affected by rot when it is brought to the wood room and prepared for the chipper. The degree of such rot varies greatly and it is often a question whether more is lost or gained by preparing it for the digester. Where it is so far gone as to be reduced to very small pieces and removed with the "saw dust" by the chip screens there can be no question of its value, but above this in grade comes that wood which is still moderately firm and hard but which, when dry, shows the white lines due to the presence of dry rot. The screening loss of such wood is doubtless much greater than that of perfectly sound wood yet a very considerable proportion finds its way into the digester. The two problems relating to the value of such wood are the losses it undergoes during the preparatory process before it reaches the chip bins and the amount and quality of the fiber it produces. The first of these can be investigated only on a large scale and the results for any given degree of rot must necessarily vary with the type of equipment used in the wood room. The second, however, can be tried out on a small scale and the findings should be much more widely applicable to the industry. For this reason the following results of two small scale cooks may be of interest.

The wood used in one cook was from a selected, sound log while that for the other was chosen as representing most nearly the condition described above. This wood was thoroughly permeated with the threads of dry rot but was still quite hard and firm. No wood which could be crumbled readily in the hands was used. The quality of the wood was found by taking blocks from pieces which were in practically the same condition, and weighing and measuring them before and after drying. One specimen of sound wood and two of the rotten were so tested and the results are given in the following table:

	Kind of Wood		
	Sound	Rotten	Rotten
Weight wet blocks in grams	2667.0	784.4	478
Weight bone dry blocks in grams	1568.5	508.5	404
Percent moisture	41.2	35.2	15.5
Volume of wet blocks, cu. in.	286.7	121.2	94.1
Volume of dry blocks, cu. in.	270.3	108.0	87.8
Apparent shrinkage, percent	5.7	10.9	6.7
Lbs. per cu. ft. of			
Wet wood, wet weight	35.45	24.70	19.36
Wet wood, dry weight	20.88	16.01	16.36
Dry wood,	22.10	17.95	17.45
Bone dry weight per cord of 100 cu. ft. wet wood	2088	1601	1636

The wood used in the cooks was cut into discs, ⅝in. with the grain, and chips prepared from these by hand; they were therefore more uniform in size than the average mill chips. Before cooking they were boiled in water for one hour and then packed into the digester. The conditions of the two cooks together with the yields and characteristics of the fiber are tabulated as follows:

	Sound wood	Rotten wood
Cooking acid		
Total SO_2, percent	5.34	5.43
Free SO_2, percent	4.26	4.39
Combined SO_2, percent	1.08	1.04
Maximum temperature, Degrees C	144.5	144.5
Time to reach 100° C, hours	2-2/3	2-7/12
Time to reach 145° C, hours	7-¼	7
Max steam pres. lbs.	45	45
Hours at max. steam pres.	2	2
Total time of cooking, hours	91/3	9
Blowing test, ccN/10 iodine for 5 cc	1.05	1.20
Yield of good fiber, percent of bone dry weight	45.8	47.4
Yield of screenings percent of bone dry weight	0.6	6.6
Bleach required, percent on air dry wt.	17	Over 30
Beating test on air dry fiber lbs. per sq. in.	54.4	43.3

The fiber from these two cooks is very different in appearance; that from the sound wood is of a good, light color while that from the rotten wood is much darker throughout and the shives in particular are very brown and numerous. The higher yield from the rotten wood is accounted for by the fact that all yields are based on the bone dry weight of wood used and as the processes of decay have removed part of the non-cellulose constituents the percentage of cellulose remaining is necessarily greater. If these yields are considered as applied to the weights per cord given in the first table it is found that sound wood yields 956 lbs. bone dry fiber per 100 cu. ft. of solid wood while the rotten wood yields only 767 lbs. This means that for every 10 cords cooked the yield is one ton of air dry fiber less than it would be if the wood were perfectly sound. Besides this decreased yield there is the poorer color already mentioned, the weaker condition of the unbleached fiber as shown by the beating test, and the fact that the fiber from the rotten wood is practically unbleachable, all of which emphasize the desirability of keeping such rotten wood out of the digester provided a high grade product is essential and that sound wood can be obtained in sufficient quantity.

Stained Wood

Under certain conditions of storage the outer portions of spruce logs become discolored or stained a grayish brown color, and the question arose as to whether this stained wood was as satisfactory for making sulphite fiber as the clean, bright chips of normal color. The staining is particularly noticeable in wood which has been river-driven to its destination, or which has been stored in a very wet condition with the bark on. In some cases the stain is merely on the surface while in others it penetrates the wood for as much as an eighth of an inch or more. It appears to be caused by the coloring matter of the bark, or inner bark, which becomes dissolved and then penetrates the adjacent wood. It is quite certain that the actual presence of inner bark on the wood is not responsible for the discoloration for

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Note. Mr. Sutermeister's article follows very appropriately the article on molds and stains by Mr. Blair in the Pulp and Paper Magazine of May 25, 1922. Reprints are available at 10 cents each.—Ed.

an examination of the chips prepared from such wood proves that those which show staining are entirely free from bark.

While the exact nature of this stain was not known to the writer, the prime object of the investigation was not to discover its cause, but rather to see what effect it would have upon the fiber prepared from such chips. To study this problem a series of cooks was made in a small lead-lined digester heated by a gas flame. Three different grades of chips were used in these tests, but all were selected from the same lot of commercial chips. For the first cook they represented as nearly as possible the entire lot and no attempt was made to sort them beyond removing knots and any very large pieces. For the next three cooks the chips were very carefully selected so that each contained as much as possible of the stained wood. The final two cooks were also made on selected chips but in this case they were chosen as represeting the cleanest and soundest wood which could be obtained. No rotten wood was allowed in any of these cooks so that, apart from the stain, equally good results would be expected from all cooks.

The chips for each of these cooks were boiled in water at atmospheric pressure for one hour and then drained to remove excess water before packing into the digester. It was found by experience that this method of operating produced fiber which was of practically the same quality as that made in large scale operations. Each cook was for a total time of 10 hours. The temperature was so regulated that the charge reached 100° C in two and one half hours, and 145° C at the seventh hour, at which point it was maintained to the end of the cook. The gauge pressure reached 75 lbs. in from four to five hours, was held at that point until the ninth hour and was then dropped to 50 lbs. at the tenth hour, when the cook was complete. This schedule was adhered to as closely as possible and while there were slight unavoidable variations they were not of such a magnitude that they would affect the yield or the bleaching properties of the fiber to any appreciable extent.

The following table gives the bleach required by the screened fiber. The yields are figured as bone dry fiber based on bone dry wood used, but the bleach required is based on air dry fiber containing 10 percent of moisture.

Chips	Bone dry wt. used gms	Acid used c.c.
Average	670	5200
Stained	945	“
Stained	670	“
Stained	670	“
Best selected	670	“
Best selected	670	“

SO_2 in acid			Percent yield		Bleach required
Total	Free	Comb.	Good fiber	Screenings	Percent
6.37	5.66	0.71	41.8	0.7	10.6
7.05	5.66	1.40	41.7	0.7	16.0
7.00	5.62	1.38	44.0	1.6	15.6
7.04	5.65	1.39	39.4	1.1	15.4
7.04	5.61	1.43	42.5	0.6	8.7
7.00	5.58	1.42	41.0	0.3	8.5

The yields from these cooks show slight variations but the average yields from the different grades are remarkably close together, from which it may be concluded that the staining is not of such a nature as to decrease the yield.

The bleaching qualities of the fiber, however, vary quite widely with the different grades of chips. That from the best selected chips gives the standard color with only 8.6 percent of bleach, while that from the average chips requires 10.6 percent and from the stained chips 15.7 percent. Since practically the only difference in these cooks is in the quality of the wood it must be concluded that this staining is a very undesirable condition where bleached fiber is to be produced. Even the small proportion of such chips in the average sample used in the first cook is seen to exert an appreciable effect.

If unbleached fiber is the product desired there would still be a serious objection to the stained wood for the fiber made from it is darker in color than that made from normal wood and it is full of dark colored shives ranging in size from single fibers to good-sized fiber bundles. If much of this stained wood were present, as in the cooks in which all stained chips were used, the fiber could only be used for low grade products. These shives are quite largely eliminated during bleaching, though some are present as brownish yellow shives in the bleached fiber.

These two investigations point out one direction in which sulphite pulp can be produced more economically or of higher quality. It is of course not possible to keep all rotten or stained wood out of the digesters once the wood gets into this condition in the yard or pond, but it does prove that there is a very material advantage to be gained by preventing it getting into this condition, and it is quite certain that much improvement can be made along this line by adopting proper conditions of storage.

THE SEASONING OF PULP STONES

by W. T. SMALLWOOD, the Smallwood Low Stone Co.

It takes a million years to make a Pulpstone.

But you can destroy one in a very short time if you use it before it is properly seasoned. Pulpstones are taken from the bowels of the earth where they have been for ages and have become thoroughly saturated with quarry water. It takes considerable length of time after the stone is taken from the quarry for the quarry water that is in the stone to evaporate, and when the water passes from the stone through the pores, cementation takes place as the quarry water mixes with the silica sand and the other minerals that are in the stone, forming a binder as the stone dries out, and a case-hardening effect is the result. On account of the pores of the rock being so small, it takes a long time for the quarry water to pass from the stone and for the cementation which forms the binder to take place.

The importance of properly seasoning pulpstones cannot be emphasized too strongly, because the right kind of a pulpstone properly seasoned will give months of service, whereas a green stone, full of quarry water, is likely to last but a few hours.

We suggest seasoning your pulpstones one year, but longer is decidedly better.

Large stones for magazine grinders should be seasoned at least two years.

Anticipate your pulpstone requirements and season them before placing them in the grinders, and you will find it one of the best investments that you have ever made. It is our aim to help you lower your cost of production, and seasoning your pulpstones is a step forward.

Vocational Education and the Superintendent[*]

By A. D. Wood, The Champion Fibre Co.

It happens often that we start out to do ne thing and actually do another. Columbus started out from Spain with the hope that he might discover a short route to India; he accomplished a more important thing in the discovery of America. In reading the history of many industries we find that by-products often prove of greater value than the main product for which the works was built. An inventor will work for years upon some problem and secure a patent upon some device. He will employ energetic attorneys who will make the claims as broad as possible and many claims will be allowed. But the inventor may find, after his device is on the market, that a new field for its use will be developed. His original claims as set forth in his patent papers may not include the use of his invention in what proves eventually to be its most important field of usefulness. He has accomplished something greater than he planned. So the reward of our labor sometimes exceeds our expectations.

The T. A. P. P. I. boys, who act as the Vocational Educational Committee of the Technical Association of the Pulp and Paper industry, conceived the idea of editing and publishing a set of text books on Pulp and Paper Making and made several claims, concerning the value of this work, to the industry at large. This was done through the paper trade publications, by letter, pamphlets, etc., and I believe that all the claims which they made, relative to the value of this organized effort, are perfectly valid, but as classes are organized and the text books out into service we men who are watching the work and its reactions, have been astonished at some new developments. There are some claims, which might have been made, to favorably impress the paper manufacturer with the project, which were omitted for the very good reason that the Committee didn't know it was going to work out that way. This work is actually going to be of tremendous value to the Superintendent. It wasn't the intention of the Committee — they didn't mean to do it — but it is working out that way. So I am going to try to tell you about it.

A song was written a few years ago entitled "School Days" and one line runs like this: "Lets take a trip on Memory's Ship" and I am going to ask you to do this, not "back to childhood days," but back to the time when you first began to assume the responsibilities which have been piling up on you ever since. How many times have you, in your years as a superintendent, wished in your innermost heart, whether you gave voice to the wish or not, that you could fill many positions in the mill with men who would attend to things as you attended to them when you were serving your apprenticeship in the mill? How many times has your mill suffered from a delay in one department or another, which you felt would have been foreseen and avoided, if you, instead of some other fellow, had been on the job in the department responsible for the delay?

What quality did you possess which the other man nowadays seems to lack? Wasn't it a willingness to accept responsibility? Isn't it a difficult matter today, to find a man who gives evidence of feeling as keen a sense of responsibility as you felt when you were working your way up?

In my study and observation of men who attend classes in Pulp and Paper Making at our plant, I came to the conclusion that a very large percentage of these men, subconsciously perhaps, seemed to welcome responsibility. And this seemed to grow with them as they progressed with the class work. The Superintendents who taught the other branches of study agree with me. This reaction was felt by electricians, brick layers, pipe fitters and boiler house men as well as by the pulp and paper makers. These men are preparing to accept responsible positions so why shouldn't they shoulder, with thanks, any additional duties and responsibilities which come their way?

Here is where the Technical men fell down—they didn't claim any result like this when they asked for funds. They didn't know that this frame of mind would be a by-product of this kind of education.

I want to hammer this in. If some one came to your plant and interviewed the man who holds the purse strings and *convinced* him that for a few hundred dollars he could change the mental attitude of the working force so that the members of that force would be inviting you to make them responsible for more details of their work, right on the job on which they are working, he'd immediately send for you and ask you what you thought about it. He certainly couldn't raise any objection if a man wanted to watch a sulphite digester as though it belonged to him personally or if he felt a great pride when he beat the best former record for quantity and quality. But the trouble seems to be that the fellow who holds the purse strings might willingly hire a man to preach a sermon on responsibility development, but isn't willing to pay for Vocational Educational work of which responsibility development is a by-product.

I will not make a positive statement as to why men change their attitude toward their work as they progress with their studies. Perhaps we all like to apply the knowledge we gain and we naturally do not object to assuming responsibility for something we know all about. It seems natural, as we know more, for us to try and find ways to express it.

You may say there are only a few men who would avail themselves of the opportunity for education but if you have a few men here and there throughout the plant, who are accepting responsibility and working loyally as a result of Vocational Education, this educational work will prove to be a good investment for your Company. And you don't have to sermonize at all. These men will be on your side and won't know how they got there.

As I was reviewing this paper with one of our foremen who taught a class in brick laying, he asked me this question: "Have you ever thought of the influence that the class man has on the men who did not attend the classes?"

He asserted that he know that these lessons as received were being carried through to the workmen who were not school men, and that it was making them better workmen.

Again I ask you to resume the trip upon the "Ship of Memory". As you accepted responsibilities, the acceptance of which put you in your present position and kept you there, isn't it so that you frequently saw scientific devices which you thought would be workable, and would be dividend earners for your Company, but they were not "fool-proof". That is what you said about them. Then you'd continue: "It'd be alright if I was there myself or if I had some one to stay with it, but those fellows up there wouldn't take any interest in it. They don't like these new things any too well especially if it's one of those things which will cut out a man from the crew." So you didn't have time to bother with it. Of course you could have some one come in and preach another sermon about it, and then try it out. You remember all about it, and how it actually worked. Right here I want to state that you'll be astonished to learn how hungry many of the class men are concerning a thing like this, and I might add that it was understood in our classes that when a group of our men wanted to know something about some special feature of the work, it was up to the teacher to set aside the text book and devote a session, or more if necessary, to the subject named. We did not stick to the text books anyway. We simply used them for three quarters of an hour at each session, and so far we have been studying simple arithmetic, then the other half of the session, forty-five minutes, was given over to the description of some device with which men were working or some process with which they were familiar. If the class wanted to discuss Acid Making and the Acid Plant, we'd let the Acid Maker help out on the work, under the guidance of the teacher. If you want to learn a whole lot about the mill you are running I'd suggest that you start a class like that and teach it yourself, (The Tech man also forgot to mention what a help these classes would be to the Super *if he taught them.*)

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[*] Address at the meeting of the Superintendents' Association, Kalamazoo, June 1-3, 1922.

But to go back to the question of these new devices which are not "fool-proof". The technical man didn't mention, did he, when he invited the trade to contribute to the Text Book fund, that the class man would be eager to work with devices yhich were not "fool-proof" and that he'd try and find out all about them and make an honest effort to be responsible for them, just as though he were the Super?

Another trip with memory: Do you recollect saying to yourself; "Of all the responsibilities which I feel the one which weighs heaviest upon me concerns the safety of my men". Can you remember thousands of nights when you went to bed wondering if each department was in the hands of safe men? After many years of service these thoughts are doubtless uppermost in your mind, and wouldn't you rest a little easier if you knew that "Jimmy", one of the best men in the Steam class had his eye on that Boiler House like a "pussy at the rat hole" and that, among his helpers, there were a number of fellows who were learning all they could about steam boilers? Yet the men who are asking for funds to further the work of publishing the text books never came here and suggested that Vocational Education was a reasonable, sensible method of promoting the work of Safety First. They didn't even suggest that you ask your Company to "come across" so that you could get a better night's sleep. Nor did they mention that reliability development seems to be a by-product of Vocational work of this kind.

Just one more thought: Sometime or other in your mill life you've had to deal with a man who was absolutely unreasonable—you recollect how just and reasonable you tried to be with him, but he was an absolutely hopeless case. You had to fire him. Costly business, firing men. Again, some of you have had the same kind of dealings with groups of men who were just as unreasonable and just as much of a nuisance. You'd think by the way some of them acted that they thought the letters U. L. on the Union Label stood for Unreasonable Lopsidedness. But you let them work on. Hell of an expense, wasn't it ? I believe that Vocational Education will improve this state of affairs.

The suggestion was made at the last meeting of the Vocational Educational Committee of the T. A. P. P. I. that some money toward completing the work on the text books might be obtained through the influence of the Superintendents.

All you fellows have good judgment. You all are close observers. There isn't a man here who couldn't track an elephant through four feet of snow and I think you'll accept Vocational Education as worth while.

I am not asking you to pass the hat though if anyone present wishes to make a personal contribution it will be gratefully received. But I am asking you Superintendents to interest yourselves in this work and ask your companies to support it. Here is an opportunity for you to take part in a splendid work. It's a good thing; let us push it along.

TEXTBOOKS FOR STUDENTS OF PAPERMAKING

The following critical review by Mr. T. J. Keenan, F. C. S., editor of **PAPER**, will give the reader a good idea of the nature of the textbooks.

Volume III of the textbooks on the manufacture of pulp and paper, in course of preparation by the committees on vocational education of the paper industry of Canada and the United States, is of remarkable interest and value. The two earlier volumes, being concerned chiefly with elementary studies in arithmetic, mathematics, physics and chemistry, which are treated fully in the ordinary school textbooks, were not received with much enthusiasm. But Volume III makes up in ample measure for any deficiencies in scope, plan or contents of Vols. I and II.

The book opens with a section on the properties of pulpwood, in which the structure of the parts of plants of value for paper pulp is delineated by photomicrographs and described in the text. Some of the best reproductions of fibers of different woods to be found in any work on the microscopy of fibers are shown in the opening pages. It is possible from a study of these fibres to obtain a clear mental pictuure of the physical appearance of the commoner papermaking fibres. A table of the average length of fibres of the coniferous and non-resinous woods is furnished, the average of twenty-two woods being 3.5 millimeters, or, roughly, one-seventh of an inch. The fibre lengths of fifteen non-resinous woods range from 1.80 millimeters for tulip tree wood to 1 mm. for both chestnut and maple, the average length being 1.29 mm. or approximately one twenty-second of an inch.

The book is divided into nine sections and two of the sections are subdivided into Parts 1 and 2. In the section dealing with the properties of wood, some thirty-nine pages are taken up with an enumeration of important fibre-producing plants other than wood, as well as lessons on the structure and growth of wood and the physical properties of wood in general. This part closes with a series of questions based on the text and their is an excellent bibliography of the literature bearing on the subject. Part 2 treats of the chemical properties of wood and describes the constituents of wood in detail, especial attention being paid to cellulose and related carbohydrates. No definite stand is taken concerning a structural formula for cellulose both Green's and Hibbert's formulas being given. In regard to alpha and beta cellulose, it is explained that the first named is the higlhy resistant form, identical with the cellulose of cotton, while beta cellulose is less resistant and can be dissolved from wood by means of strong alkali, and afterwards precipitated from solution with acid. Beyond stating that a part of the cellulose which is unaffected by the acid and remains in solution is called gamma cellulose, no more is said of this form of cellulose.

The preparation of pulpwood through all its stages from log pond to chipper occupies the whole of Section 2, consisting of forty-eight pages and a page of examination questions. which puts such queries as "What is the nature and purpose of a slasher?" and "Explain the construction and operation of a pulpwood chipper," closing with question fifteen, (a) What is the effect of fungus growth on pulpwood? (b) What conditions favor the growth of fungi?"

Section 3 deals with the manufacture of mechanical pulp and is introduced with a description and history of the process by H. J. Buncke, who explains that the section is based on a thesis submitted to the University of Maine in partial fulfillment of the requirements for the degree of master of science. A flow sheet of the operations in a mechanical pulp mill afords a graphic outline of the course of the wood from block pile to storage.

This section is freely illustrated with types of grinders, magazine as well as pocket grinders. No detail is neglected, even to sharpening devices for stones and types of burrs. A typical mechanical pulp mill is illustrated by diagrams. The power consumed is studied in its appropriate place, and nothing appears to be neglected. After describing the different kinds of pulp used for special purposes and the conditions of manufacture, the power consumption and pressure applied in each process are set forth. Examination questions pertaining to the subject treated are appended.

The manufacture of sulphite pulp forms an important chapter, occupying eighty-six pages of Section 4. It opens with a history of the early attempts made to cook wood with a solution of sulphur dioxide in water and the later commercial development of the process of cooking wood with solutions of magnesium and calcium bisulphites. The course of material through the process of converting wood chips into sulphite pulp is shown by a flow sheet where the preparation of sulphite acid by the tower system and direct cooking of the wood are contrasted with the milk of lime system and indirect cooking. We regard this section or chapter of Volume III as one of the most valuable in the book. Especially noteworthy is the part descriptive of acid control systems and the determination of sulphur trioxide in burner gases. The cooking process is described with an amount of detail that is appropriate for the instruction of students, the parts of a digester being enumerated and described in text and by illustration.

Sestion 5 on the manufacture of soda pulp is by Arthur B. Larchar and is complete in sixty-eight pages. The wisdom of getting specialists to treat particular processes appears to be justified in this chapter by Mr. Larchar, which, while concise, is yet comprehensive and explains in admirable fashion all of the operations in the oldest chemical process for making pulp from plants. We should have liked, however, to see a greater amount of coordination among the authors as regards the naming of woods used in different processes. Mr. Larchar gives cottonwood as a synonym for balm of Gilead, which will be news to soda mill men in other parts of the country than the part from which Mr. Larchar hails. We have heard of balsam fir being called balm of Gilead, but cottonwood is a variety of poplar and is never called anything else but cottonwood or poplar. (See explanation, next page.)

We shall return to a consideration of this section and the remaining sections of the third volume of the vocational education textbooks in a succeeding issue of **PAPER**, but before closing this notice we would urge upon all who have use for the book to send for it without delay. It is well worth the price of five dollars which has been placed upon it by the publishers.

The concluding chapters of Volume III on *The Manufacture of Pulp and Paper* are eminently practical in both scope and treatment. Section 7 on the treatment of pulp is by a well known newsprint mill superintendent, J. O. Mason, of the Laurentide Company, Grand'Mere, Que. In it are given full details of the manufacture of mechanical pulp or groundwood. An engraving of a line drawing illustrates the screen system employed, and we may remark that an excellent outline of the system has been impaired by too much reduction. The cut could have been made of full page length to advantage. The machines used in screening are described separately.

Some interesting observations on the terminology of papermaking are to be found in this contribution of Mr. Mason's. Thus it is noted that the word "riffler", used in this country to designate an apparatus through which the liquid pulp is passed with the object of catching impurities heavier than water, is in Europe more appropriately termed a sandcatcher.

While on the subject of terminology, it may be appropriate to point out here a common misuse of the term "consistency" for consistence." While, we agree with Emerson that a foolish **consistency** is the hobgoblin of little minds," it is important we think to be consistent in matters of terminology. When speaking of the firmness, coherence, density or solidity of bodies we think of their **consistence**, but reference may be made to **consistency**, of conduct, character, or opinion "consistency, thou art a jewel." However, language is not made by lexicographers, but is developed and becomes standard according to the usage of good speakers and we know of many good speakers in the pulp and paper industry who persist in the use of consistency where a lexicographer would say consistence.

The instructions given in this volume on the practical manufacture of pulp appear to be beyond criticism. Teachers will probably complain that they are altogether too practical, not enough being left to the imagination of the student, and it might be of value to get an expression of opinion from some recognized authority on teaching methods regarding methods of instruction followed in certain portions of the book.

The methods of sampling and testing pulp given in Part 2 of Section 8 follow those which have been officially adopted by the technical associations of the industry in this country and Canada. This part has been written by Max Cline, B. S., and the subject is treated with great thoroughness from the standpoint of a practical papermaker as well as that of a mill chemist. A good description is given of the method of determining the copper number of cellulose and the examination questions covering the whole of Section 8 on the refining and testing of pulps appear admirably designed for the purpose of testing the pupil's knowledge of the subject.

The bleaching of pulp is covered in Section 9, which is a contribution of H. H. Hanson, S. B. The actions and effects of bleach on pulp are briefly described and the several methods of manufacturing bleaching powder and bleaching solution are fully treated, even to the electrolytic processes of making bleach at the mill. There is a discussion of the older bleaching systems as contrasted with the new modern methods, and types of bleaching tubs and other mechanical systems are illustrated by means of well executed drawings, which figure as engravings in the text. There is a diagrammatic representation of the bleaching of groundwood by the use of sodium bisulphite solution. It is noted that the bleaching is not permanent and the finished product gradually assumes a grayish appearance. The subject of bleaching methods for mechanical or groundwood pulp is treated much more fully by A. O. Bragg, of Florence, Ala., in a recent contribution to PAPER. Notes are appended on the consumption of bleach by different pulps and fibres and there is a paragraph on the hazards of the bleaching process. The student is taught methods of testing and analyzing bleach and bleaching solutions, but as might be expected only in such detail as is necessary for practical purposes.

The third volume of the series of textbooks on **The Manufacture of Pulp and Paper** prepared by the Joint Vocational Education Committee of the Paper Industry in Canada and the United States is one that will be eagerly sought by all who are interested in papermaking and no library of papermaking will be complete without it. From this it may be inferred that we consider this book to be more than a mere student's manual and this is true as it partakes of the character of a reference book on the whole subject of pulp and paper manufacture.

(Orders for these books outside the United States may be sent to the Pulp and Paper Magazine, Gardenvale, Quebec, with remittance of $5.00 per copy.)

EXPLAINED BY MR. KELLOGG

Balm of Gilead and Poplar

My dear Keenan—I have been reading with much interest your excellent review in the April 26 issue of Volume III of the pulp and paper textbooks.

So far as your criticism of Larchar's tree knowledge is concerned, I believe that it is about a fifty-fifty proposition.

Larchar should not have given cottonwood as a synonym of Balm of Gilead. The common cottonwood is **Populus deltoides,** while Balm of Gilead or balsam poplar is **Populus balsamifera.** All of the populus genus of course, is good soda pulp material. Balsam poplar or Balm of Gilead is found from New York and New England to the Arctic circle and the ordinary aspen has an even wider range.

On the other hand while balsam fir is sometimes called Balm of Gilead in books, I have never known that name to be applied to it in common usage.

—R. S. Kellogg

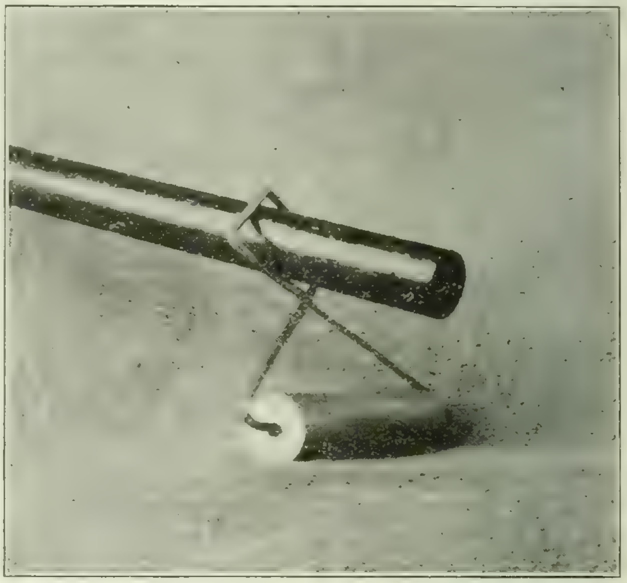
TREE PLANTING IN CANADA

This is the season of the year when tree planting is being actively carried on throughout Canada. In Ontario and Quebec, farmers are improving their woodlots by planting seedling trees sent out from the provincial forest nursery stations at St. Williams and Berthierville, respectively; and in both provinces there is considerable activity in regard to municipal forests, particularly in Ontario, where the first planting work is being done on some of the newly established county forests. In the Prairie Provinces about five million seedlings and cuttings, all told, will be sent out from the Indian Head and Saskatoon forest nursery stations of the Dominion Forestry Branch. These are all for planting shelter-belts on farms. Besides this, these same nursery stations are sending out a considerable quantity of planting material and tree seeds for planting material and tree seeds for planting and sowing on different Dominion forest reserves. This is only a beginning in reforestation, but it indicates that the tide is at last turning in that direction.

A ROLLER FOR LONG BARS

By Harry Moore, Montreal, in Canadian Mining Journal

Where no proper facilities are provided, it is a common sight to see men dragging long bars of steel over the shop floor, cutting ugly grooves in the latter and incidentally giving themselves much needless exertion. One man who had work of this kind to do from time to time, made the simple little roller shown in the photo. The roller itself is a piece of scrap steel with a hole in the center, through which passes a lenght of quarter-inch wire bent to form a Vee square as it were. The end of the round bar is inserted in this, and when the workman pulls at the other end, the wire grips the bar tightly between the Vees, thus holding it to the roller and keeping it square at the same time. Various size bars can be handled with this device, those that are too big to go through the wire requiring the services of more than one man to transport them successfully.



FOREMEN TRAINING COURSE WAY OUT WEST

An interesting report has been received from the far west of a foreman's conference held in January, along the general lines of the similar conferences held for the foremen of the Champion Fibre Company at Canton, N.C., and the Hammermill Company at Erie, Pa. The Portland conference was held for the foremen of the Crown Willamette, Everett and Inland Empire Paper Companies, and the foreman of some of the companies traveled several hundred miles to attend. These companies have been holding mill conferences of foremen to discuss plant problems, as part of advanced and efficient personnel programs. The Portland conference was to take to the foremen a different type of training, to help them learn to discharge their responsibilities better.

The state supervisors of trade and education of Oregon and Washington participated in organizing the work, which was so planned as to be in harmony with the important work being done along vocational educational lines by the Technical Association of the Pulp and Paper Industry. As was the case at Canton and Erie, however, the foremanship training was entirely different from the work being done with the text books, for whose preparation the paper industry of the United States and Canada expended over $40,000, and which are in use by mill employees in several mills where classes have been established.

The Portland course lasted two weeks.

(Continued from last issue.)

Flow-Box. Sometimes called Head Box. On a fourdrinier machine, box or chest divided vertically into two or three compartments, placed before the apron to receive the stock from the screens and break the rush so as to deliver an evenly flowing stream over the breast roll on to the fourdrinier wire.

Flowers of Sulphur. Volatilized sulphur, deposited on cooling as a fine dust—an acid-plant trouble due to insufficient air supply or too rapid cooling of sulphur vapors. Sublimed sulphur.

Fly Bars. See **Beater.**

Fly Paper. Paper coated with oil and molasses, or other sticky substance, which renders it sticky, or impregnated with some chemical such as arsenic, quassia bark, etc., to render it poisonous.

Foam. See **Froth.**

Foil. Paper coated with aluminum, tin, copper, zinc or lead, used for packing or decorative purposes.

Folio. A book size in which one sheet folded once forms two leaves. The largest size of book. See **Sizes of paper.**

Foolscap. A writing paper originally distinguished by the water-mark of a fool's cap. See **Sizes of paper.**

Foot Pound. The energy required to raise one pound through a vertical height one foot.

Foot Valve. A valve at the bottom of a suction pipe.

Formation. The setting of the fibers into fixed position. This begins as soon as the stock leaves the flow box, and is generally influenced by the shake, speed and first suction boxes, as well as by other factors.

Formalin. A disinfectant — properly, formic aldehyde. in formaldehyde.

Fourdrinier. See **Paper Machine.**

Fourdrinier Part. That part of a paper machine, containing the endless travelling horizontal wire, on which the sheet is formed. The portion carrying breast roll and table rolls is usually kept in motion by a horizontal lateral shake; in addition to the forward motion of the wire and at right angles to it.

Fourth Hand. The junior member of the paper machine crew. He assists the third hand in operating the winder in forming the rolls.

Free. Referring to stock, largely of long fibers little beaten, readily parts with water on wire and suction, boxes leaving sheet with a "wild" blotchy appearance if too free.

Free Rosin. The rosin present in rosin size in excess of that required to combine with the soda to form the rosin **soap.**

French Chalk. See **Talc.**

Friction. Glazed paper having a high surface, due to passing between rolls running at different speeds.

Front. The operating or tending side of a paper machine.

Froth. Accumulation of tiny bubbles caused by mechanical or chemical action in paper stock which cause defects in the finished paper, due to the bubbles breaking while the sheet is being formed on the wire.

Fruit Papers. Thin papers, usually of sulphite or sulphate pulp, similar to tissues in texture, used for wrapping fruits before packing. Some may contain a small amount of paraffin wax.

Fuchsine. A red aniline dye, also called magenta and rosaniline.

Fumigating Paper. Paper soaked in potassium nitrate, dried and then steeped in an alcoholic solution of some fragant balsam, such as tolu or storax.

Fungus. A plant of low order. There is a wide range of fungi, from fine moulds to mushrooms. Some are very destructive of wood and wood pulp.

Furfural. A compound obtained by treating oxycellulose with hydrochloric acid. When this is done quantitatively, the amount of furfural obtained is a measure of certain properties of the fiber.

Fustic. A vegetable coloring matter derived from the heartwood of some varieties of West Indian and South American trees.

G

Gas. Matter in a state wherein it tends to expand in all directions. Sulphur dioxide and chlorine are examples. Water becomes a gas above 100 deg. C. at atmospheric pressure.

Gasket. A sheet or ring of a compressible material used as a means of making water or gas tight connections.

Galvanized Iron. Sheet iron coated with zinc.

Gate. The movable partition in a flow box or vat to admit stock to paper machines. In pipe fittings a form of valve having such a movable partition. In foundry work, holes in the mould by which to introduce the molten metal and relieve the overflow; also, the metal left in the gates when cooled.

Gauges. Instruments by which to measure the pressure of steam or water depths of liquids in containers, or amount of vacuum in such apparatus; such as, evaporators and condensers.

Gelatine. A substance extracted from hoofs or skine of animals. Used as a sizing material for paper and as a surface coating for photographic papers.

German Silver. An alloy containing zinc, nickel and copper; also called packfong, victory silver, and new silver.

Glass Paper. Paper coated with glue and sprinkled with finely powdered glass, used in cabinet working.

Glass Water. See **Sodium Silicate.**

Glazed

(1) Fitted with glass, as a window.

(2) Having a highly polished surface, as certain forms of coated paper and board.

Glazed Boards. Box boards glazed by any process.

Glucose. $(C_6H_{12}O_6)$. Grape sugar, a carbohydrate obtained usually by action of acids on starch. Is also the final product of the action of acids upon cellulose; it is this reaction that leads by fermentation to the production of alcohol from wood waste, and waste lyes from pulp mills.

Glue. A substance obtained from hoofs, horns, and bones of animals by boiling with water and drying the product. Gelatine is the chief constituent of glue.

Glycerine. A syrupy liquid with a sweetish taste. Specific gravity 1.260. obtained as a by-product in the soap industry, derived from fats; chemical formula $C_3\ H_5\ (OH)_3$. Used with litharge as cement for sulphite digester linings, and as a constituent of printers' ink rolls. Hygroscopic and therefore used as an ingredient to prevent drying of inks, etc.

Gommeline. See **Dextrine.**

"Good". A ream or package containing no "outs" sheets.

Grain. A small unit of weight (originally the weight of a grain or corn). One gram weighs 15.432 grains. In the paper, the direction of manufacture on the machine, as "across the grain."

Gram. The basic weight unit of the metric system. The weight of a cubic centimeter of water of 4 deg. C. 28.31 grams = one ounce avoirdupois.

Granite. A mottled paper, imitating granite. Composed of fibers of two or more contrasting colors.

Grass Bleached Tissue. Thin tissues of special white, used for wrapping stationery goods. The name is intended to indicate the open air bleaching of the sun on linen or cotton cloth.

Gravity. Properly, in this connection, specific gravity. The weight of a substance compared with the weight of an equal volume of water. In mills it usually refers to the reading on the stem of a hydrometer, according to the scale used.

Grease Proof. A class of wrapping papers rendered impervious to oily contents by hydrolysis in the course of long beating. Imitation Parchment.

see **Vegetable Parchment.** Waxed papers are not grease proof.

Great Eagle. See **Sizes of Paper.**

Green Vitriol. Sulphate of iron.

Griffith's White. See **Lithopone.** See **Ferrous Sulphate.**

Grinder. Grinding. The machine and the process whereby wood is held by hydraulic pressure against the face of a revolving grind-stone in the presence of water, in the preparation of mechanical pulp or ground wood.

Grocery. A general term for all kinds of papers used in the grocery and provision trades.

Ground Wood. Pulp produced by grinding wood by means of circular grindstones in the presence of water. Synonym of mechanical pulp.

Guard Board. An inclined board placed on the top couch roll. It strokes the felt pile of the jacket, preserving a smooth surface.

Guide Roll. An adjustable roll forming part of the carrying system for the fourdrinier machine wire, wet felt or dryer felt. Its function is to maintain a correct travel direction.

Gum. A sticky, glue-like substance, usually soluble in water; such as, gum arabic or dextrine.

Gum Acacia, Gum Arabic. Gum exuded from several plants of the acacia family, usually in transparent, pale yellow tear-shaped pieces; also, as a powder.

Gummed Paper. Paper having one side coated with gum; used for labels, etc.

Gypsum. The natural mineral sulphate of lime. Plaster of Pairs, produced by heating gypsum to drive off the water of crystallization. The "set" of plaster is due to the reabsorption of water.

H

Half Imperial. See **Sizes of Paper.**

Half Stuff. Partially beaten rag pulp. Wood pulp not treated for sizing, etc.

Hand. Looking towards the wet end from the reels; if the drive is on the right the machine is right-handed, and conversely left-handed. See also **Sizes of paper.**

Hand-Made. Paper made on hand molds in sheets having a rough or deckle edge on four sides. Applied also to machine-made paper simulating hand-made in having two or more deckle edges. See **Deckle.**

Hanging. Wall papers.

Hard Water. Water containing carbonates or sulphates of lime and magnesia.

Harper. A form of fourdrinier machine in which the wire travels away from the presses, the flow box being placed between the breast roll and the first press, and the wet sheet carried on the felt back over the wire to the first press.

Head
(1) The vertical distance, usually in feet, through which water falls effectively on the wheels in water-power plants.
(2) On a fourdrinier paper machine, the depth of stock in the pond.

Head-Box. See **Flow Box.**

Heavy Spar. See **Barium Sulphate.**

Hemlock. Tsuga canadensis or Tsuga heterophylla. A coniferous tree not very suitable for mechanical pulp, but yielding a chemical pulp which can be used for the manufacture of all grades of paper.

Hemp. See **Cannabis sativa.**

Hemp Paper. Papers made from hemp, hemp refuse, old rope, etc. Used for wrappers, cable, and insulating purposes , and sometimes called hemp browns.

Hitch Roll. Roll from which felts reverse their running direction. Roll arranged to adjust the tension of the felt.

Hollander. An early design of beating engine, becoming obsolete. The name is due to the fact that the beater as now constructed was, in general principles, introduced about 1800 from Holland. Hollander type beater as opposed to other designs of beating engines such as Umpherston, Taylor, Horne, Rabus, etc.

Hopper. A funnel-shaped, box used in filling digesters, rag boilers, stokers, etc., and to provide temporary storage.

Horse Power. The unit of engineering work; equals 33,000 foot-pounds per minute.

Hosiery. Papers used in the hosiery trade.

Housing. Covering, such as that placed over the roll of a beater.

Humidity. The condition of the air with reference to moisture. When air contains all the water it can carry as invisible gas, a very slight reduction in temperature will cause condensation, or mist; this point is termed the dew-point. Relative Humidity is the percentage of the total water-carrying power or ratio of moisture actually present to the amount necessary to cause saturation.

Hydrated. Chemically combined with water; e.g., slaked lime is hydrated. Well beaten stock is said to be hydrated.

Hydraulic. Pertaining to liquids in motion or under pressure. The term usually refers to machinery operated by falling water, or by the transmission of pressure through water.

Hydrocarbons. Compounds of hydrogen and cardon only. The petroleum compounds are hydrocarbons. Cellulose is not, because it contains oxygen in addition to carbon and hydrogen.

Hydrocellulose. A friable powder, obtained by exposing cellulose,previously dipped in a dilute mineral acid, to air. Paper dipped in weak sulphuric acid or in moderately strong bleach liquor, and then warmed, is quickly destroyed because of this change in constitution.

Hydrochloric Acid. An acid (HCl) occasionally used to hasten the process of bleaching paper pulp. The compound is a gas soluble in water. The strongest form in common use is called "concentrated" and is an aqueous solution containing about 37 per cent. HCl; Sp. Gr. 1.19. A common name is muriatic acid, and it is sometimes called spirits of salt, being obtained from common salt by the action of sulphuric acid.

Hydrogen Dioxide Hydrogen Peroxide. A compound of hydrogen and oxygen. H_2O_2, which has a strong bleaching action by reason of its unstable character, which tends to a breaking up of its molecule and liberation of nascent oxygen. $2H_2O_2 = 2H_2O + O_2$.

Hydrolysis. The breaking down of organic compounds by the entry of the molecule of water. This is one of the principal reactions in cooking wood for pulp.

Hydrometer. An instrument for measuring the specific gravity of liquids. Hydrometers usually consist of a bulb elongated to save space,surmounted by a stem on which are the graduations; the whole is weighted in such a way as to float vertically. The instrument sinks farther in light liquids than in dense ones, and the scales are based on this fact. See **Beaume.**

Hygrometer. An instrument for measuring the amount of moisture in the air. One form consists of two thermometers, the bulb of one being coverred with wet silk, and the other dry. The air circulating about the wet bulb causes evaporation, which lowers the temperature. The difference between the wet and dry bulb temperatures is a measure of the saturation of the air. (See **Humidity.**) Air approaching saturation will evaporate very little at the wet bulb, so the difference in temperatures will be small.

Hygroscopic. Having the property of taking moisture from the air, deliquescent.

Hypochlorite of Lime. Calcium hypochlorite. See **Bleaching Powder.**

Hyposulphite of Soda or Hypo-antichlor. Properly, thiosulphate of soda. A white crystallized or granular substance used to correct excess of bleach.

I

Idler. A pulley which directs or carries a belt, or by pressure or tension puts a slack belt into operation. It does not transmit power.

I. H. P. Indicated horse power; the result obtained by calculation from an indicator card.

Imitation Art. Paper heavily loaded with clay and run through damping calenders.

(To be continued.)

The Paper Markets of Europe

Strong Recovery In Sweden

Frankfort, June 5th.—According to German manufacturers, who are in a position to know both sides. Swedish newsprint is cheaper and more active than the German. The reasons for this state of things are twofold: The German policy of raising the price in the unwise attempt to place it on nearly a parity with the price on the world's markets, has overshot the mark and German manufacturers are now thoroughly disturbed by finding that demand has naturally left them, and by the inevitable action of economic law, has transferred itself to other countries.

The commercial Journal of Sweden, Affärsvärlden, in its current issues is decidedly optimistic in regard to this feature of the Swedish market. Summarizing these reports the position in Sweden may be called generally satisfactory: "The market for sulphite pulp is specially active; the quantities of strong pulp taken are particularly noteworthy. European demand for easy-bleaching pulp is fair, but from overseas numerous orders are coming in. Prices on the English market where demand has increased slowly but steadily, are:

For easy-bleaching £12.5 per ton c. i. f. English ports.
Strong, prime £12. to 12,15 per ton c. i. f.

From France and Italy demand is particularly good for bleached sulphite at 95 to 110 francs per 100 kilos c. i. f. French ports, at 1600 lire per ton c. i. f. Genoa, while sales of strong pulp are reported at 60 to 65 francs and 120lire for two kilos c. i. f. Spanish paper makers are paying 34 pesos c. i. f. The American market is developing well, although slowly; prices are generally unchanged, 2.45 to 2.75 dollars per cwt. of strong, and 3.90 to 4, dollars per cwt. of bleached pulp ex dock. These prices are cheaper than the German. Great interest is felt over the possibility of an American duty on wood from Canada, and a duty on newsprint is regarded here as practically certain. Large orders for ground wood have been received from France and England at unchanged prices, 60 to 63 crowns per ton for Göteborg. The market for dry mechanical is also active at 120 to 135 crowns per ton. A new impetus has been given to the newsprint market, and production during the year, when the figures are given out, will show a notable increase. An important factor in this increase is the output of the new paper mill at Jössefors, a description of its newsprint machine, given in the Trävarutidning, indicates a present speed of 800 feet a minute, and an output of about 14,000 tons of paper a year.

German News Print Above Parity

Frankfurt, June 6. On the Bourse today the quotations for newsprint were:—Home price; 13000 to 14,ooo marks (about 47 dollars) a ton: New York 3 1-2 cents per lb. c. i. f. and 7 1-4 cents per kilo. f. o. b. German ports. These figures excited a good deal of remark among paper exporters and wholesalers, and it was evident that the above quotations of this important article of commerce were considered unnaturally high. On inquiry it was found to be the best opinion that if these prices are maintained, German newsprint will no longer be relatively cheap, and will, as a necessary consequence, lose its favored position, because it is now actually above its parity with pricces on the world's markets. In fact some manufacturers, when asked, admitted that it has lost the markets, and pointed to the accumulation of unsold stocks and stagnation, as proofs. The manufacturers, who are responsible for the high prices, find themselves in the rapids, the current has carried them too far, and in their attempt to make the mark equal the dollar, their concerns have gone over the dam.

The instinct of all Germans is to make something out of their depreciated money; but few persons outside Germany know on what an extensive basis this instinct stands and what secret national ends it serves. One of these purposes is the introduction of coefficients for every article of trade, and these ioefficients are now so high in many instances that when the inland price is multiplied by a figure that will make the goods cost as much as they would in New York, the price resulting is often absurdly high, and far above that of the world's markets. This, of course, defeats its own object, which is to keep the price of goods as high as possible, without over-topping the figure at which they can successfully meet competition. It is easy to see the anxiety with which German paper makers view the position of their products. The cry is to keep the price down, and one proposal to effect this result is the suggestion to make a sixty per cent. assessment of the surplus profits on exports on newsprint. This surplus, or the difference between the inland price of a ton of newsprint and the price at which it is sold in New York, was often supposed to be much greater than it really is. As a matter of fact the Committee of the Reichstag, after careful inquiry, found that this profit from the different exchange value of money (Valutagewinne) is diminishing alarmingly owing to the high price of newsprint at home. An exporter told the writer that the "cheapness" of German newsprint today was nothing but piffle. "Many foreign countries were producing it cheaper."

The Market Crisis In Russia

In an article under this head, the Moscow Pravda, No. 16. May, says: "The industrial crisis of 1922 differs fundamentally from that of last year. Hitherto all industries had to hand over their products without payment to the State. The basis of the crisis was that the State was unable to provide industrial plants with the the necessary coal and raw materials. The results were; The concentration of industries, restriction of output and decline in production, because only a few of the more important could be supplied with materials. At the present time industry has been put back on a normal economic basis, but the want now is CAPITAL."

There seems to be something in these reports of industrial revival in Russia. Even if they are largely propangada, they mean that there are people willing to pay for their belief in Russian development, for propaganda is a costly business and implies an object and money to back it. The number of newspapers and books published in Russian is astonishing —Every day three appear in Frankfurt, and their advertising columns certainly show that business is going on. One of the most trustworthy of German Trade Journals, "Der Konfektionar" of May 28, states that all the Russian industries are incorporated in trusts, cartells, manufacturers' associations, with a good many private concerns in free operation. A very significant thing is the present activity of 24 produce and stock exchanges, dealing in all commodities, textiles, paper, metals, grain, furs, wood and pulpwood, etc. And their factor is the creation of the First Russian Export Trading Co., Ltd., with a capital of 4 million gold rubles. Evidently capial also is making its appearance.

Technical Section

REVIEW OF RECENT LITERATURE

A.— Properties Chemistry and Testing of Materials

A-1; A-15 Glucosan. AME PICTET and PIERRE CASTAN, Univ. of Geneva. **Helv. Chim. Acta,** iii, 645, (1920); **Paper,** xxviii, 20-21, (May 25, 1921). Translation by Harold Hibbert, Yale Univ. The probable formula is given. -A. P. -C.

A-1; B-4 Jack Pine as a Pulp Wood. Pulp and Paper, xix, 1091-1092, (Oct. 27, 1921). A popular article on the suitability of Jack pine for the manufacture of paper pulp is produced and complemented by data on Jack pine collected from various articles previously published and compiled by W. B. STOKES of the Forest Products Laboratories, Montreal. -A. P. -C.

A-3 Bagasse Paper. CH. GROUD. **Papier,** xxiv, 226-228, (May 1921). Brief discussion of the suitability of bagasse as a source of paper. -A. P. -C.

A-15 Absorption of Alkalis by Cellulose. I. M. KOLTHOFF. **Pharm. Weekblad,** lviii, 46-56, (1921); **Analyst,** xlvi, 257-258, (June 1921). Although cellulose does not absorb sodium and potassium hydroxides in the physical sense, they are taken up by it from solutions, and with concentrations up to 4 **N** the amounts are proportional to the concentration. Thus, from sodium hydroxide solutions of 4**N**, 2**N**, **N**, 0.5**N**, 0.1**N**, 0.5**N**, and 0.01**N** strength, undried cellulose removed 3.2, 1.4, 0.65, 0.35, 0.085, 0.04, and 0.011 molecular-equivalents per gram respectively, and in the equation $\frac{x}{m} = Ac$ these results therefore show $A = 0.8$. With dried cellulose the following figures were obtained: from 4**N**, 2.1; 2**N**, 1.1; **N**, 0.58; 0.5**N**, 0.3; 0.1**N**, 0.055; and 0.05**N**, 0.03; giving $A = 0.55$. Between concentrations of 4**N** and 6**N**, the amounts taken up are constant and independent of the concentration: 3.3, 3.2, and 3.1 for 4**N**, 5**N**, and 6**N** respectively, and chemical combination takes place. Above 6**N** a sharp increase occurs and amounts again become constant: 5.2 and 5.5 for 7**N** and 8**N**; a different combination is formed. Alkali carbonates are not taken up by cellulose. From barium hydroxide more is taken than from alkali hydroxides; thus filter paper took 0.53, 0.52, 0.28, 0.30, 0.14, and 0.03 molecular equivalents per gram from barium hydroxide solutions of 00.29**N**, 0.27**N**, 0.095**N**, 0.087**N**, 0.028**N**, and 0.0084**N** concentration respectively, and with cotton wool the amounts were 0.62, 0.39, 0.22, and 0.14, with 0.3**N**, 0.15**N** and 0.03**N**. The amounts taken up are proportional to the square roots of the concentration. Ammonia is taken up only in the presence of other alkalis. -A. P. -C.

A-15 Absorption of Lead and Copper by Cellulose. I. M. KOLTHOFF. **Pharm. Weekblad,** lviii, 152-159, (1921); **Analyst,** xlvi, 258, (June 1921). Neutral solutions of lead salts are not completely absorbed by cellulose. If an alkali hydroxide containing carbonate be added to the solution, all the lead is removed, but this is due to precipitation of most of the lead, after which the remainder is absorbed. With very dilute lead solutions, the amount adsorbed by cellulose is dependent on the concentration; in stronger solutions the amount absorbed is proportional to the alkalinity of the ash of the cellulose. -A. P. -C.

A-15 Constitution of Cellobiose (Cellose). W. N. HAWORTH and E. L. HIRST. **J. Chem. Soc.,** cxix, 193-201, (1921). The structure of cellobiose has been investigated and experimental evidence is brought forward in support of the constitutional formula proposed previously **(J. Chem. Soc.,** cxix, 809, 1919.) Cellobiose may be regarded as glucose-betaglucoside. -A. P. -C.

E.—Acid Pulp Processes and Equipment

E-3 Sulphite Yield Tests from Average Wood, Infected Wood, and Chipper Sawdust. JOHN S. BATES. **Pulp and Paper,** xix, 607-610, (June 9, 1921). Detailed account of mill-scale experiments carried out at the Kenogami mill of Price Bros. & Co., Ltd., during December 1920 and January 1921. A digester cook was first run off on average pulpwood to find, by careful measurements, the cause of the considerable reduction (about 20 per cent) in yield per cook as compared with 1913. A second commercial run was made on selected rotten or infected wood to compare the results in view of the recent practice of saving balsam fir trees affected by decay. A third cook was made on the fine wood material rejected by the chip screens as a possible means of utilization in preference to burning in the boiler house. The tests were considered in relation to the regular sulphite for news print and board products. In the first test there was a total yield of oven-dry pulp amounting to 45.93% of the oven-dry weight of the wood in the digester, which was about all the wood could produce. A corresponding test made in 1913 in the same digester showed the yield from the same number of cords was now about 20 per cent. less than 7 years previous. This is probably explained by the much higher proportion of dense spruce at that time. In run No. 2 the total yield of No. 1 pulp, screenings, and knots was 45.9 per cent. of the chips on the oven-dry weight basis, i.e., exactly the same as in run No. 1. The strength, freeness, action on the news print paper machines, and quality in general of the No. 1 sulphite from this run were surprisingly close to those of regular sulphite, although the color was more of a dull yellow and the screening test showed more fine fibers. The yields of No. 2 pulp and knots were a little higher than usual, probably on account of wetter wood, due to the absorbent action of decay. The results showed that infected wood is still good for sulphite, at least provided decay has only discolored the wood without reducing it to soft punk. The chipper sawdust used for run No. 3 represented the average pulpwood reduced to a finely divided condition, but not as fine as ordinary sawdust from slashers or sawmills. The cooking conditions were milder than for ordinary news print sulphite. Washing in the blow-pit took a longer time than usual on account of the fineness or "slowness" of the pulp. The laps from the wet machine occasionally cracked a little when folding, and the pulp was slightly dirtier than usual, but was comparatively good in color and general appearance. The total yield of No. 1 sulphite (44.67 per cent) and refined screenings (1.02 per cent.) was 45.69 per cent. of the sawdust on the oven-dry weight basis. It was used in making jute board on the cylinder machine; but it was considered that the fiber would be quite suitable for news print if properly mixed with regular sulphite. -A. P. -C.

E-0 Acidproof Mortar. Can. Patent No. 214,511. A. W. EKSTROM, Dec. 6, 1921. The mortar is made up of Portland cement 8 to 16 parts by volume, chamot 3 to

7 parts, alum slate 1 to 4 parts, to which may be added suitable filler. It is mixed with a suitable quantity of waterglass of suitable concentration just before using. The chamot renders the cement waterproof, the alum slate makes the mass ductile, and the waterglass converts the mass into a paste, acts as a binder, and keeps the mass homogeneous, even after drying. -A. P. -C.

E-0 Acidproof Mortar. Can. patent No. 214, 512, P. G. EKSTROM, Dec. 6, 1921. The mortar is made up of blast furnace slag 55 to 78 parts by weight, litharge 12 to 30, pot stone 10 to 15 parts, with or without filler. The mixture is stirred with waterglass just before using. The litharge or other lead oxide, e.g., mud from accumulators, forms acidproof silicates with the silica of the slag. The pot stone, which can be replaced by asbestos, magnesia, or other "fat" magnesium minerals, makes the mass ductile. By suitably proportioning the constituents the mass can be made so as to have the same expansion coefficient as iron. After setting the mass is very elastic and can be alternately heated and cooled without breaking. -A. P. -C.

K.— Paper Manufacturing and Equipment

K-4 The Separation of Plant Fibers by Bacterial Action. J. MICOL DE PORTEMONT. **Papier,** xxiv, 224-225, (May 1921). Brief outline of the action of various organisms in retting processes. -A. P. -C.

K-8 Dyeing of Paper Pulp. J. HUEBNER. **J. Soc. Dyers and Col.,** xxxvii, 139-145, (1921); **J. Soc. Chem. Ind.,** xl, 382-383A, (June 15, 1921). In the manufacture of paper pulp the degree of disintegration of the fibers produced by beating greatly influences the affinity of the pulp for dyestuffs. When samples of pulp produced from purified cotton yarn are immersed under comparable conditions in a solution of Night Blue the amount of dyestuff absorbed was inversely proportional to the average length of the fibers, and while unbeaten cotton yarn showed a constantly increasing absorption during 72 hours, the absorption by the most highly disintegrated pulp was almost complete during the first hour. The highly disintegrated pulp absorbed almost twice as much dyestuff as the unbeaten yarn, but had no greater depth of shade. In the pulp made from wood, increasing disintegration augmented the rate of absorption but did not influence the amount of dyestuff absorbed. When immersed in a solution of Night Blue, jute, bleached poplar pulp, and unbleached sulphite absorbed the dye more quickly than bleached esparto and cotton halfstuff. The sizing of paper pulp greatly increases its affinity for dyestuffs, and when resin size was added to a bath containing Metanil Yellow or Scarlet R and alum, the pulp immersed therein rapidly absorbed 80 to 90 per cent of the dyestuff. For the production of cheaper and faster shades, such mineral colors as Iron Buff, Chrome Yellow, Manganese Bronze, and Prussian Blue should be precipitated within the pulp. Acid dyestuffs have little affinity for paper pulp unless it is heavily sized. Fast shades are obtained by precipitating an acid dyestuff by means of a basic dyestuff in the pulp, and useful combinations are Auramine and Naphthol Yellow S; Chrysoidine, Magenta, or Brillant Green and Orange II; Victoria Blue and Water Blue or Methylene Blue; Rhodamine and Eosin, etc. Direct dyes are especially suitable for the production of mottled paper, and the shades obtained are fast. -A. P. -C.

K-12 Head of the Stock Back of the Slice. H. LHOMME and M. ARGY. **Papeterie,** xliii, 445-448, (May 25, 1921). Translated by A. Papineau-Couture in **Paper Industry,** iii, 1120-1122, (Nov. 1921). In machine made papers the strength in the machine is greater than in the cross direction on account of the tendency of the fibers to arrange themselves in the direction of flow of the water which carries them. This may be largely overcome if the speed of the stock under the last slice is equal to the speed of the wire, as the relative velocity then becomes zero. The height of stock (**h**) required to give this velocity (**v**) is given by the formula $h = \frac{v^2}{2g}$. A table is given showing the values of **h** for values of **v** ranging from 5 to 350 meters per minute (0.083-5.85 m. per sec.). The proper height of the last slice above the wire can be calculated from the consistency of the stock, the weight of the paper, and the velocity of the stock, dividing by the proper coefficient of contraction for that kind of aperture. For newsprint weighing 45 g. per sq. m. on a machine working at 300 m. per min. (about 1,000 ft. a min.) the height of the slice should be about 13.8 mm. (about 0.55 in.) and the height of the stock about 1.74 m. (about 70 in.). The latter is higher than is usually seen on paper machines, but is probably not very far from that actually used on machines working at about 1,000 ft. -A. P. -C.

K-12 Effects of the Arrangement of the Suction Boxes on the Life of Fourdrinier Wires. E. MESSMER. **Monit. Papeterie Francaise,** lii, 323-325, (June 1, 1921). Translated by A. Papineau-Couture in **Paper Trade J.,** lxxiii, 80, 82, (Nov. 10, 1921). The wear of fourdrinier wires is mainly due to the high tension under which they work. This in turn is very largely due to the high suction generally used, which causes the wire to adhere strongly to the suction boxes, increases the tension in the wire, and causes considerable friction as the wire passes over the edge of the suction boxes with a corresponding amount of wear. The importance of the adherence of the wire to the suction boxes is proved by the fact that it has been shown that at least 70 per cent. of the total power required to drive the wet end of the paper machine is used up in overcoming the friction of the wire and the suction boxes. On the other hand, if the suction is reduced (other things remaining equal) the sheet will not be sufficiently dry when it reaches the couch roll, so that it will be crushed at the presses and will stick to them, causing breaks. If the suction boxes are placed side by side, so that the sheet is continuously under suction from the time it arrives at the first box until it leaves the last, a much lower vacuum can be used. The sheet will be sufficiently dry when it reaches the presses and the wear on the wire will be greatly reduced. In a certain mill, after effecting the change in the arrangement of the suction boxes, the total vacuum was reduced about half, the dryness on reaching the presses increased about 30 per cent., and the production of paper per wire (or, what comes to the same thing, the life of the wires) increased about 50 per cent. -A. P. -C.

K-18 Boxboards and the Multi-Cylinder Mold Machine. W. H. SILVESTER. **Paper,** xxviii, 14-15, 22, (June 1, 1921). Address before the Technical Association of Paper Makers, England, together with discussion of the paper. -A. P. -C.

K-21 Floor Paper Made from Sponges. PAUL TACUSSEL. **Papier,** xxiv, 198-199, (May 1921). Analyses of a large number of samples of felts for laying on floors under carpets and linoleums has given as the average composition: sponges 55 per cent., animal fibers 20 per cent., jute 20 per cent., miscellaneous fibers (spruce pulp, cotton, flax) 5 per cent. It is sized with 5 to 8 percent of rosin and is loaded with China clay. It

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UNITED STATES NOTES

The will of James Outterson, paper manufacturer of Northern New York, who died May 6, was filed for probate in New York City last Friday. Mr. Outterson bequeathed the bulk of his estate to his widow, Mrs. Eva S. Outterson of Carthage, N. Y. She will receive all the personal effects and the life income of a trust fund of $400,000, which later is to be divided between her daughter, Mrs. Eva G. Balmat of Carthage, and a granddaughter, Mary G. Outterson. A codicil of November 19, 1920, sets apart a trust fund of $200,000 for Eva Madeline Murphy, formerly of Carthage, who is to receive the income during her life, the principal later to be divided between the two younger heirs who inherit Mrs. Outterson's share. The Carthage Free Library will receive a bequest of $25,000.

Discussing trends in the lumber industry, the *Timberman*, in a current issue tells of the migration westward of the paper and pulp industry in the United States during the last thirty years. The number of paper mills in Wisconsin are cited as furnishing a striking evidence of this movement. The development of the paper industry and the value of paper, says the *Timberman*, enables its manufacturers to compete in the log markets with the saw-mill operators, and paper manufacture always follows the lumber industry. The spruce and hemlock forests of the Pacific Northwest of the United States and British Columbia are now furnishing pulp, not only for paper mills of their own, but are also sending shipments East. The *Timberman* believes that Portland will become the lumber center of the United States. It is admirably situated for this purpose, since it is midway between the north and south limits of the Douglas fir region, and at the gateway to the pine producing districts of the Inland Empire.

W. B. Van Allen of Carthage, N. Y., acting for New York and New England creditors of the Northern Fiber Company, has come into possession of the company's pulp mill at Ontonagnon, Mich. Bidding in at a bankruptcy sale ordered by a referee for a United States district court, Mr. Van Allen acquired the property for $102,000, less than one-seventh the amount spent on it by the Northern Fiber Company. The plant was left incomplete when the war time market broke, sending the Northern Fiber Company into bankruptcy. The plans of the new owners for the disposal of the property are still incomplete but it is understood that there is a strong probability that it will be changed from a pulp mill into a paper mill, although the fact that a large amount of money must be expended to finish the plant and put it on a producing basis may delay action.

Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, and George W. Sisson, Jr., hand of the Raquette River Paper Company, have sailed for Europe on a joint tour of investigation of the paper industry on the continent. Dr. Baker will give particular attention to a study of the situation in Scandinavian countries and Germany.

The town of Madison, Maine has voted to contribute toward the construction of a bridge across the canal at Madison, meeting the offer of the Northern Paper Company to give $15,000 of the cost if the town would authorize a contribution of $3,000. President Garret Schenck of the company, addressing a town meeting, said that his company is planning extensive improvements at its plant, and offered to replace the present 6f foot bridge with one 25 feet longer.

I. S. Reynolds is leaving the sales organization of the Groveton and Claremont Paper Companies subsidiaries of the Brompton Pulp and Paper Co. to become general sales manager and vice-president of the well known firm of New York paper merchants, Coy Hunt and Co., Mr. Reynolds will be succeeded by G. M. Wetmore as head of the Groveton and Clarmont sales forces. Mr. Wetmore has served as assistant to Mr. Reynolds since January, 1920, when he joined the sales staff of the Groveton and Claremont Paper Companies after having served the Diem and Wing Paper Company and other well known Western paper houses for a number of years.

Grosvener M. Jones, chief of the Paper Division of the Bureau of Foreign and Domestic Commerce, according to an announcement from Washington, will resign so as to take charge of the new financial division of the bureau. Mr. Jones in all probability will be succeeded by John Matthews, Jr., sales manager of the Miami Paper Company of West Carrolton, Ohio. Mr. Matthews has been accepted for the place in accordance with Governmental regulations, but his application has yet to be passed upon by the United States Civil Service Commission. Pending the confirmation of Mr. Matthews' appointment, Constant Southworth, who has been assisting Mr. Jones, will be in charge of the division. Mr. Southworth was with the United States Tariff Bill. The work of the Division is to be broadened so that in addition to handling paper, boxboard and other paper commodities, the division will also handle printed matter, printing, lithographing machines, etc.

Wilfred Wylde, head of the chemical research department of the Eastern Manufacturing Company of Bangor, Me., has been appointed manager of the Liberty Paper Company. Mr. Wylde is a graduate of the Massachusetts Institute of Technology, He has been lecturing on paper making during the past two years at the University of Maine.

Oscar Thilmany, founder of the Thilmany Pulp and Paper Company of Kaukauna, Wis., died at Frankfort-on-Main, Germany, May 21, according to word received by his friends in Wisconsin. Mr. Thilmany was 80 years old. He was one of the most successful paper manufacturers of the Fox River Valley. He retired in 1901, and lived in Germany in recent years. Mr. Thilmany is survived by his widow and one daughter.

THOROLD MAY GET BLEACH PLANT

The Coniagas Reduction Company handling Cobalt ore at its Thorold plant is reported to have made arrangements to amalgamate with the Electric Gas Bleaching Co., of Niagara Falls. It is said that the latter Company has an improved method for treating the Cobalt ores and also expects to market chlorine and caustic soda. Some of its output is now being sold to paper and pulp mills in the St. Catharine's neighborhood.

When we are undeservedly praised, we commend our critic's judgment. When we are deservedly censured, what do we do?

PULP AND PAPER NEWS

Mr. J. Holland, export manager of Becker and Company, London, England, is now in Canada on his way home from an extensive tour in Australasia.

On June 1st, the Howard Smith Paper Mills, Limited, put into operation the first bank of calls of their chlorination plant at the Cornwall mill.

The Rolland Paper Company, Limited, have decided to construct a new penstock at their Mount Rolland mill. The present penstock of wood will be domolished and a new one of steel built.

A firm of commission merchants in Barbados would like to secure a Canadian agency for printing paper. For particulars, ask Dept. of Trade and Commerce, Ottawa, about Trade Inquiry 4810.

Work has been commenced on the construction of the groundwood and newsprint mill of the St. Lawrence Pulp and Paper Mills, Limited, Three Rivers, P. Q.

The fiscal year of the Spanish River Pulp and Paper Mills ends June 30. A favorable report is expected.

A dividend of 1-2 of one per cent. has been declared on the capital stock of Price Bros. and Co., for the quarter ending May 31., payable July 2, 1922, to shareholders of record June 22, 1922.

Mr. W. H. Sheriff of the Hodge-Sheriff Paper Co. Toronto, has returned from an extensive business trip in the West. He reports a very general feeling of confidence in the sound position of Canada. Harvest prospects are very satisfactory and business actually transacted and in prospect is in better volume, though orders are still predominantly small.

Holders of preferred stock in the Abitibi Power and Paper Co. will receive a quarterly dividend of 1 3-4 per cent. on July 3rd.

WOODLANDS SECTION SUMMER MEETING

The Woodlands section of the Canadian Pulp and Paper Association will hold its summer meeting on July 17-20. The arrangements for which are now completed. The meeting will take the form of an automobile tour of the Adirondack region with visits to the Delaware and Hudson plantations, the State plantations en route to Saranac Lake, the State Nursery at Lake Clear, the plant and hardwood operations of the Ovalwood Dish Company, the State Lookout Tower near Chestertown and the New York State Nurseries at Saratoga Springs.

The trip will be made by automobiles, starting from Montreal on Monday, July 17th, at 8 A.M. and arriving in Montreal on the return journey on Friday, July 21st. It is expected that enough members will drive their own cars so that accommodation will be provided for all who desire to make the trip.

While the main object of the excursion is to provide the Section with an opportunity to inspect the many interesting woodlands developments along the route chosen, the Committee of arrangements has also had in mind the recreative features and have arranged their program with a view of making the outing thoroughly enjoyable in all respects. The expenses will be defrayed by the Secretary and pro-rated amongst those participating at the end of the trip.

It should be stated that the section will welcome the presence of other members of the Pulp and Paper Association.

As it is necessary that hotel and other accommodation be arranged for in advance, members who intend going should notify the Secretary, 701 Drummond Building ,as soon as possible, if they have not already done so, stating whether they will be driving their own cars or desire provision to be made for them.

The following is the complete program:

Monday, July 17th.

Leave Ritz-Carlton Hotel, Montreal at 8 A.M. by motor car to Plattsburg, blue book route No. 911. 71 9/10 miles, arriving about 11.30, lunch at Witherell Hotel.

2. P.M. Visit Delaware and Hudson plantations under direction of Mr. Bristol.

6. P.M. Supper at Plattsburg, Hotel Witherell, leaving afterward via route 441 to Jay, and 431 to Lake Placid, 50 8/10 miles. Spend the night at Stevens House, Lake Placid.

Tuesday, July 18th.

Visit State plantations en route to Saranac Lake 10 miles, State Nursery at Lake Clear, lunching at Wawbeek Hotel, 21 7/10 miles via route 484, proceed to Tupper Lake 7 8/10 miles via route 484 and visit the plant and hardwood operations of the Ovalwood Dish Company. Proceed to Newcomb, 40 miles via route 484, where we will sleep.

Wednesday, July 19th.

Visit hardwood operations on lands of Mr. Pruyn. Proceed to Chestertown via route 484 41 3/10 miles, and visit the New York State lookout tower near that point, lunch at Chestertown, Hotel Chester, proceed to Saratoga 46 miles by route 421, or 51 miles by route 422, staying the night at the Congross Hotel.

Thursday, July 20th.

Visit New York State nursery and plantations, afternoon spend in recreation. Congress Hotel for the night.

Friday, July 21st.

Leave for Montreal routes 421, 441, 991

INTERLAKE NOT INTERESTED

The last number of U. S. Commerce Reports contained an item from the United States Consul General at Vancouver stating that the Interlake Tissue Mills of Merritton, Ont., are interested in the Westminister Paper Co., Ltd. The new mill is to be built at New Westminster, near Vancouver, for the manufacture of light weight papers, such as fruit wrapping. The Pulp and Paper Magazine is informed that the Interlake Tissue Mills have no connection whatever with the new concern.

WESTERN CANADA MILL BOUGHT

The Manufacturing Holding and Investment Corporation of Toronto has acquired the plant at Port Mellon, Howe Sound, B. C. of the Western Canada Pulp and Paper Co., Ltd. This is a 40 ton sulphate pulp plant.

We are informed unofficially that the purchase terms include 70 per cent. on the outstanding first mortgage bonds.

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contains about 10 per cent of moisture and 13 per cent. of ash. The paper is flexible, elastic, and rough to the touch. It is 3.5-4.5 mm. thick, has a bursting strength (Ashcroft) averaging 8 kilos, and (for paper weighing 950 g. per sq.m.) a breaking length of 2,300 m., and an elongation of 4 per cent. It is manufactured in England and is used especially in England, Belgium, and Northern France. -A. P. -C.

M.— General Mill Equipment

M-4 Shaft Bearing Design. Papeterie, xliii, 434-445, (May 25, 1921). General discussion of the proper design of shaft bearings. -A. P. -C.

M-8; N-4 Rust Formation on Condensed Water Outlet Pipes. E. SAUER. **Chem. Ztg.**, xlv, 421, (1921); **J. Soc. Chem. Ind.**, xl, 375A, (June 15, 1921). Rapid corrosion of the condensed water pipes of the radiators of a large drying plant was traced to the presence of carbonic acid in the boiler feed water. When the feed water was treated by the lime soda process on the Breda system, thereby reducing the total hardness to about 3 degrees, and eliminating the carbonic acid, the corrosive action of the condensed water practically ceased. -A. P. -C.

M-12 The Uehling Single and Multiple Unit CO_2 Recorder. Paper, xxviii, 12-13, (June 1, 1921). Description of Style U Uehling CO_2 recorder. The principle involved in the operation of the instrument depends on the change in pressure caused by a change in volume in a stream of gas flowing through two apertures. The gases are aspirated continuously through two apertures, and the CO_2 is absorbed in the chamber between the apertures. The reduction in the gas volume due to the absorption of the CO_2 causes a change in pressure which is registered by a suitable indicator and recorder. Multiple unit equipments combine in a single outfit means for measuring CO_2 from 2, 3, 4, 5, or 6 boilers independently and simultaneously. They are built on the "unit" or "sectional" plan and may be added to as required. The recorder operates on the hydrostatic principle, thereby avoiding springs, levers, and joint movements. The record is continuous, not intermittent.-A. P. -C.

N.— Power Generating and Equipment

N-4 Unusual Corrosion of Boiler Tubes by Carbon Dioxide. B. G. WORTH. **Trans. Amer. Electrochem. Soc.**, 1921, 329-335; **J. Soc. Chem. Ind.**, xl, 375A, (June 15, 1921). Severe corrosion of a water-tube boiler using natural water softened by a standard lime-soda process was found to be due to the presence of solid bicarbonate of iron, $H_2Fe(CO_3)_2$. The bicarbonate decomposed into ferric hydroxide and carbon dioxide on heating the water, and after the introduction of a preheater and the removal of the liberated carbon dioxide before entering the boiler corrosion practically ceased. -A. P. -C.

P.— Safety Engineering And Welfare

P-3 Group Insurance in the Pulp and Paper Industry. A. C. CAMPBELL, Group Life Division, Metropolitan Insurance Co. **Pulp and Paper**, xix, 633-635, (June 16, 1921). An explanation of Group Insurance and of its advantages to both employer and employees. -A. P. -C.

Q.— Planning And Construction

Q-2 Selecting the Proper Site for an Industrial Plant. Paper, xxviii, 11, 22, (June 1, 1921). Brief discussion of the following points in the selection of a site for a manufacturing plant: availability of the raw materials, labor supply, fuel and power supply, water, disposal of waste products, transportation, markets, space for expansion. A. P. -C.

R.— General

R-1 The "International" Paper Mill at Three-Rivers. J. N. STEPHENSON. **Pulp and Paper**, xix, 612-613, (June 9, 1921). A brief description of the mill under construction as it appeared in the early part of 1921. For description of the mill at the beginning of 1922 see **Paper Mill**, xlv, 1, 2, 8, 10, (Feb. 4, 1921.) A. P. -C.

R-2 The International Chemical Index and the Reproduction of Documents. J. H. FRYDLENDER. **Rev. Prod. Chim.**, xxv, 73-78, (1922). A general discussion of the problem of searching the bibliography of a given subject, and of obtaining original articles or documents which may need to be consulted. The various photographic methods used or proposed for the reproduction of articles or of patent specifications are reviewed, discussing their merits and drawbacks. The author suggests that the best solution of the problem would be that periodicals should run off a certain number of copies of each issue on a copying paper, film, etc., so that when any issue is out of print any article in that issue, or the whole number if required, can be easily and cheaply reproduced by one of several processes (autographic, heliotype, blue-print, etc). These special copies could be either kept in the offices of the respective periodicals or sold to central bibliographic agencies which would pay a royalty on the articles reproduced. Frydlender also suggests that this method be used for the reproduction of patent specifications, and that specifications of the patents of all countries could be kept in and distributed from the patent office of each country. -A. P. -C.

R-4 Need of Contact Between Cost and Technical Men, FRED C. CLARK. **Paper**, xxix, No. 10, 29-30, (Nov. 9, 1921); **Paper Trade J.**, lxxiii, No. 20, 38, 40, (Nov. 17, 1921); **Pulp and Paper**, xix, 1211-1212, (Dec. 1, 1921). The fundamental ideas in plant operation are lowering costs and improving quality. A plant that works out a method that enables it to work more economically, resulting in lower costs, almost invariably discovers that by so doing it is possible to increase quality, which is due to the fact that the close study required in erducing costs brings to light additional knowledge and increase in quality. The changes which bring about lower costs and improved quality are effected by the technical man; but their effects are measured by the cost man, and close co-operation between the two is necessary to obtain best results. -A. P. - C.

R-13 Meeting of the Woodlands Section of the American Paper and Pulp Association, Chicago Nov. 1-4, 1921. Paper, xxix, No. 11, 9-12, (Nov. 16, 1921). A brief account of the meeting. -A. P. -C.

R-13 Annual Meeting of the Canadian Pulp and Paper Association, Montreal. Jan. 23-27, 1922. **Pulp and Paper**, xx, 84-88, 11-13, 141-144, (Feb. 2, 16, 23, 1922); **Paper Mill**, xlv, No. 4, 8-16, 52-56, (Jan. 28, 1922); **Paper Trade J.**, lxxiv, No. 5, 18-24, 26, 28, (Feb. 2, 1922); **Paper Ind.**, iii, 1547 et seq., (Feb. 1922). An account of the meeting giving the address of retiring president Wilson, and reports of the chairmen of the News Print, Chemical Pulp, Mechanical Pulp, Book and Writing Paper, Board, Wrapping Paper, Felt, Coated Paper, Woodlands, and Technical Sections, and of the Traffic Department and the Joint Committee on Technical Research. -A. P. -C.

R-13 Summer Meeting of the Technical Section of the C. P. & P. A., June 14-17, 1921. Pulp and Paper, xix, 663-665, (June 23, 1921). Account of the visit to the mills of the Saint-Maurice Valley, Que. -A. P. -C.

R-0 Forest Products Laboratory Opportunities. Paper, xxix, No. 21, 7-9, (Jan. 25, 1922). An outline of the work already accomplished by the U. S. Forest Products Laboratory and of the benefit to the industries which it serves if its work were expanded. -A. P. -C.

A NEW TECHNICAL SOCIETY

A new national technical society has been organized as a result of a preliminary meeting held during the convention of the American Paper and Pulp Association in April. At a meeting at the Chemists' Club, New York, last week, the Technical Photographic and Microscopical Society was fully organized, with the following officers:

President — James McDowell, of Sharp and Hamilton Mfg. Co., Boston.

Vice Presidents — John H. Graff, of the Brown Co., Berlin, N. H., and Bennett Grotta of the Atlas Powder Co., Tamaqua, Pa.

Secretary-Treasurer — Thomas J. Keenan, editor of Paper, New York, formerly Secretary of the Technical Association of the Pulp and Paper Industry.

At the organization meeting, Charles F. Roth, who acted as temporary chairman, gave an account of the preliminary organization work, and outlined future possibilities. It is planned to hold a general convention of industrial and microscopical photographers in connection with an exhibition of photographic work, chemicals and apparatus to be held at the Grand Central Palace, New York, during the National Exposition of Chemical Industries, September 11-16, 1922.

An active committee on membership and publicity was appointed with A. E. Buchanan, Jr., as chairman, and Charles N. Winter, D. H. Killifer, Douglas G. Woolf, Ernest Eberhart, J. A. Scheick and A. M. Crawford.

The next meeting will be held at the Hotel Astor, preceded by a luncheon for which a nominal charge will be made, and all interested are invited to get in communication with the secretary at 251 West Nineteenth Street, New York. The annual dues are nominal, consisting of $5. Several of the members already registered are connected with the paper industry.

CONTRACTED FOR PILES

The Raymond Concrete Pile Co., Ltd., has been awarded two contracts recently. One is for the piling required by the St. Lawrence Paper Mills, Ltd., at Three Rivers. These will be 40 foot piles.

The Fort William Paper Company is also planning somewhat further development that requires 25 foot piles and the Raymond Co. has this contract also.

CONDITIONS IN THE PAPER INDUSTRY OF POLAND

From Assistant U. S. Trade Commissioner F. W. Allport, Warsaw

A recent issue of Industry and Commerce (Przemysl i Handel) contains an article on trade depression in the Polish paper industry, designed to show that the troubles of the industry can not be traced to the low customs duty on paper. A number of factories are now operating only four days a week and giving as the cause of the curtailment of their activity the fact that imported paper can undersell their product in Polish markets. As a matter of fact, paper imported from Austria (the cheapest and most accessible source for Poland) is more expensive than the local product. In December the prices of Austrian paper on the Polish market were 511 Polish marks per kilo for note paper, 582 marks for writing paper, and 1,737 marks for tissue paper, while the Polish products were selling for 495 marks, 578 marks, and 1,371 marks, respectively.

Certain privileges are granted to importers of lower grades of paper, such as newsprint and copy-book paper, but even in these cases the price of the domestic product is lower than the imported article. If the low customs duties were the cause of the reduced activity of the paper mills, the first to suffer would be those producing grades of paper on which the duties are the lowest. It is, however, these mills that are working full time, while those manufacturing higher grades of paper, bearing an import duty of 75 per cent ad valorem, are idle.

The real cause of the stagnation of the paper industry is the fact that large stocks of the better grades of paper were purchased during the greatest depreciation of the Polish mark.—Commerce Reports.

DE-INKING PROCESS FOR WASTE NEWSPAPER

In the newsprint industry a large percentage of printed paper is classified as waste so far as the use of that product for printing is concerned. The careless handling of old newsprint increases the waste classification of old newsprint for crude paper board, box board, etc. There possibly is no industry in America which in its demands to serve the public consumes a natural resource as do the newsprint paper manufacturers. Today the economic problem of the nation's wood supply is so keen that such a large progressive paper as the Chicago Tribune carried on its editorial masthead a slogan for reforestation and for protection of our remaining forests. A re-use of newsprint would lessen the demands on American forests.

The problem of re-using old newsprint is old and has received the attention of paper makers from time to time. At the convention of Paper Mill Superintendents, held at Kalamazoo, Michigan, June 1, 2, and 3, Sidney D. Wells of the Forest Products Laboratory, Madison, Wisconsin, presented facts concerning the de-inking of old newsprint for re-use. The process described by him was tested in a Minnesota mill which used 1500 tons of old newspapers in making newsprint sold and shipped as part of its regular product. The process is considered by Wells as profit producing and so indicates an increased use of waste newsprint. The de-inking of the old newsprint and its re-manufacture can, by this process, be done in large industrial centers, thereby eliminating freight charges on haulage from paper mills in isolated woodland districts.

The United States consumed about 2,200,000 tons of newsprint paper in 1920, when during the first four months it was selling for 15 cents a pound. Current reports indicate that for the first four months of this year the newspaper publishers consumed 10 per cent more newsprint than during the same period of 1920. The continued increase in the amount of newsprint used will increase the newsprint waste correspondingly. The replacing of this waste in the economic cycle by such method as described by Wells will give waste paper a better market with its consequent effect on prices.

J. R. BELL CANADIAN V. P. OF PURCHASING AGENTS.

The National Association of Purchasing Agents of the U. S. and Canada, met in convention this year at Rochester.

Two special cars of Purchasing Agents went from Toronto. They were accompanied by Canon Cody who addressed the Canadian session, and by Piper John Reed, whose highland costume was a conspicuous feature and who drew much attention to the Canadian delegation with his skirling whustles.

Major J. Renwick Bell of Business System Ltd. Toronto was elected Vice President for Canada and polled a larger vote than any other condidate at the convention.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, June 20. — The pulp and paper industry is improving, so far as volume is concerned. The increased activity is nothing out of the way, but is sufficient to mark another stage in the process of recovery which has characterized business since the beginning of the year.

The continuance of that condition will depend upon the extent of the upward movement in general trade, which, according to current indications, should from now on make substantial progress. New capital is flowing into this country, especially from the United States, making for the expansion of old and the establishment of new enterprises. A further sign of the greater confidence is the increased corporation financing and the demand for additional capital for Canadian industrial concerns. The statement of our trade for May, issued by the Government, is the best for many months, showing a favorable balance for the first time since December, 1921. It is of interest to point out that the pulp and paper trades contributed very substantially towards this balance.

Newsprint continues to be one of the most active sections of the paper market, there being no sign of a diminution either in the actual consumption or demands for this commodity. At this time of the year it would not have been surprising if there had been a recession in the demand, but so far nothing of this nature has occurred. While this situation may not continue during the entire summer, the signs are that there will be no radical change. The mills are all very busy, and are shipping newsprint as fast as it can be produced. The outlook can be fairly described as good. Canada is holding her own in the U. S. market, and is also steadily increasing her output.

The local trade in most papers is by no means bad. It cannot be termed brisk, but it is improving slowly, although in one or two instances jobbers are inclined to take a rather gloomy view of the situation. The mills manufacturing fine and book papers state that they are running to the full extent of their capacity. Wrappings, toilets, and tissues, boards, waste paper and rags show practically no change. Naturally some departments are more busy than others, but taking the market as a whole, there is no reason to complain.

While some British papers of the fine and book classes are finding their way into Canada, our own manufacturers continue to do a substantial export trade to Australasia and also to Great Britain. Competition, however, is very keen.

After a considerable period of dullness, chemical pulps show indications of a stronger movement. Most of the mills are now pretty well stocked with orders, and some will find it necessary to carry over June business into July. With this increased activity, prices are beginning to firm up; sulphite is selling at from $75 to $95 per ton, according to grade, the higher figure being for bleached sulphite required in the manufacture of artificial silk. It may be added that their is a very good demand for this quality of pulp.

Toronto Topics

There is very little change in the general situation. Crop conditions remain fair, though there have been very heavy rains in central Ontario.

Travellers report improvements in some lines but there is still a lack in volume of individual orders, which are largely of replacement nature.

With the completion of seeding in the West business brightened up somewhat in the smaller towns and something similar has been noted here.

Market Notes

Pulp prices unchanged. Market inclined to firmness.

Groundwood, delivered $30.00 to $35.00.

Sulphite delivered, Book about $60, News around $65, Bleached $80 to $90.

Sulphate, delivered $70.00.

Book and Writing—Marked firmness is evident and anl prospects seem fair for balance of the year.

Wrappings—No. 1 Kraft M.F. $8.00; M.G. $8.15; Colored Sulphite, $8.00; Colored Kraft 9¾c. to 10¾c; B. Maniilla, $5.50; No. 1 Manilla, $6.75; Fibre Manilla, $6.75.

Bags.—Firm, advancing slightly; Light Manilla, 62 per cent. to½ per cent. of 100m. lots; Heavy Manilla 60 per cent off 100m. lots; Light Kraft 60 per cent off 100m. lots; Heavy Kraft, 50 to 10 per cent. off 100m lots; White Confect. 17½ to 10 per cent. off 100m. lots.

Tissues—No. 1 Manilla 20 x 30, 80c; 24 x 36, $1.05; Natural White, 20 x 30, 90c.; 24 x 36, $1.25; No. 1 White, 20 x 30, $1.10; 24 x 36, $1.55; Natural or No. 1 Manilla Sulphite, 20 x 20, $1.00; 24 x 36, $1.40.

Towels—Carlots. Interfolding, per case, $5.63 net.

Bleached White, rolls of 150 towels, $22.00 less 22 p.c. 50 rolls to case.

Natural 50 rolls to case, $19.00, less 22 p.c.

No. 3 towels, 50 rolls to case, $13.75, less 22 p.c.

Toilets—Car lots. List price less 20 and 25 per cent.

Paper Stock:	
No. 1 Hard White Shavings	$3.75
No. 1 Soft White Shavings	3.50
Heavy Books and Magazines	1.70
Ledgers and Writings	1.95
No. 1 Kraft	2.25
Newspapers	.80
No. 1 Mixed Papers	.17½
No. 1 Miscellaneous	.55
No. 2 Miscellaneous	.50
Roofing Rags, per ton	$25.00
No. 1 White Shirt Cuttings	10 to 10¼
Fancy Shirt Cuttings	5 to 5½
Canton Flannels Bleached	7 to 7½
White Lawns	7 to 7½
Blue Overall Cuttings	5 to 5½
Ropes and Bagging.	
No. 1 Manilla Rope	5 to 5½
Mixed Strings	25.00

No. 1 White shirt cuttings and unbleached muslin are in good demand and mills are buying fairly well. Colored cuttings not moving so freely.

NEW YORK MARKETS

New York, June 17—(Special Corespondence)—The feature in the markets this week has been the advancing trend of raw material. Various kinds of raw stock used by paper mills, including wood pulp, cotton rags, old rope and waste paper, have exhibited a strong tone, and prices on a good many grades of these materials have moved to higher levels. From all appearances, this can be taken as an indication of increased demand from consuming quarters, and increased buying of raw stock would infer that paper mills are broadening the scope of their manufacturing operations in order to take care of the business that is coming in to them from paper consumers.

That the paper market is in a firmer and healthier state than in a long time is plainly apparent. Business is active; mills are running well; jobbers are keeping busy filling buyers' orders; the movement of paper from mills into consuming channels is proceeding at a remarkably heavy rate for this time of the year; on all sides there are indications of the industry reaching a normal condition. The one ill feature of the industry at present is the prices obtaining on some kinds of paper. Efforts to fully stabilize prices and to bring paper costs down to levels where consumers could be induced to increase their buying, together with competition among manufacturers and jobbers to get their full share of business, have reduced prices on some kinds of paper to a point where is no profit for the manufacturer; in fact, there is no question but that some descriptions of paper are being marketed today at prices which mean an actual loss to mills making such paper. This is the phase of the prevailing situation which one hears discussed in various corners of the trade, and the one which is causing manufacturers to complain. It stands to reason that this condition cannot last for long, and there are many who expect to see some rather drastic revisions in paper quotations by mills during the next few weeks, especially since demand for most kinds of paper is holding up at a rate where manufacturers are not obliged to go on condoning such a situation.

The price position of book paper is still a very irregular one. Competition among mills to land as much of the current business as they can is exceedingly keen, and it would appear that some manufacturers are forgetting price in an effort to corral enough orders to keep their plants operating full. There have been sales of machine finished book of very good quality in the New York market this week down to 5.50 cents per pound f.o.b. this city, jobbers having reported buying paper from mills at this basis in a number of instances. On the other hand, coated book paper seems a trifle firmer in price, with 8.50 cents a pound f.o.b. New York about the lowest quoted by mills. Demand for book papers is gradually increasing. The improvement is not so marked in this consuming centre as elsewhere through the country, and herein lies a reason. Due to the high cost of labor in this city and the demands of the printers' union, quite a few of the largest printers and publishers have moved their plants out of New York to other parts of the States. This is a matter of prime importance to the paper industry because this exodus of printing and publishing plants from New York means that this city is no longer as large a consuming centre for book and other kinds of paper as it was. Moreover, indications are that unless some radical changes are effected in the labor situation locally, many more print shops will forsake New York and seek other locations.

One of the largest domestic producers of kraft wrapping several days ago anonunced a reduction of $5 per ton in prices; the prices now quoted by this concern being 6.50 cents a pound for No. 1 kraft and 5.75 cents for the secondary grade. The drop in domestic wrapping paper is unquestionably due to foreign competition. Thousands of bales of Swedish kraft paper are coming into the United States week by week, and is being sold to consumers here at lower prices than those quoted by domestic producers. The situation in this branch of the paper trade is one that warrants much attention. Swedish kraft paper, as is readily admitted, is just as good, if not better, than domestic paper of the same description, and the imported stock

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WOOD PULP

SOLE AGENTS IN U. S. A., CANADA,
MEXICO AND CUBA FOR

Finnish Cellulose Association
Helsingfors, Finland

AND

Finnish Wood Pulp Union
Helsingfors, Finland

is finding a ready sale in this country. So serious is this situation growing that home manufacturers are in a dilemma, and the effect on the market is best indicated by the sharp cut in prices on domestic kraft paper.

The box board market is improving at a very gratifying rate. Boxmakers are coming more and more into view as buyers, and are laying in board against prospective requirements for their fall business in paper boxes. Prices on boards have strengthened, most mills having advanced quotations about $2.50 a ton, plain chip now being quoted at $35 to $37.50 f.o.b. New York, and filled news board at $37.50 to $40 per ton.

GROUND WOOD.—Mechanical pulp is meeting with a fairly consistent demand of moderately heavy volume, and despite reports of mill stocks being rather heavy with producers running at close to capacity output, there is a marked lack of selling pressure exerted on consumers. If anything, prices on ground wood are firmer than they were a short while ago; certainly the price tone is steadier, and buyers evidently are having to pay the figures quoted to get pulp. Around $31 per ton is an average of quotations on domestic prime spruce ground wood in upper New York State, while Canadian grinders are reported from $26 a ton upward, depending on the length of the haul to the consuming mill and the tonnage of pulp involved. Newsprint mills are absorbing ground wood freely, and there is a relatively good demand from board plants.

CHEMICAL PULP—The market for chemical wood pulp displays a much steadier undertone than has been perceptible in some time. This seems due to several causes, chief of which is that paper mills are buying in larger volume than earlier in the year, an also because producers in the Scandinavian countries are holding firmer for better prices than at which they sold pulp several months ago. Sulphite of all kinds is moving in comparatively good quantities and at prices which show a stiffening tendency. Domestic No. 1 bleached sulphite is quoted at 4.50 cents a pound at pulp mills, and manufacturers are said to have sufficient business booked to keep them operating at close to maximum capacity for a month or longer. Uncleached sulphite is quotably steady at anywhere from 2.35 cents up to 2.75 cents, depending on the grade and amount involved. Foreign bleached sulphite of No. 1 quality is quoted at around 4 cents per pound on the dock here, and No. 1 unbleached sulphite at 2.40 to 2.50 cents ex dock. Kraft pulp is steady in price, with Swedish producers holding strong for their association price of 2.65 cents a pound c.i.f. New York, and with domestic manufacturers quoting between 2.75 and 3 cents at mills. Finnish kraft is reported selling at 2.40 cents per pound ex dock at this port.

RAGS.—Further advancement in roofing rag prices has been scored this week, with sales of No. 1 packing to felt paper mills reported at 1.10 cents per pound f.o.b. New York, and of No. 2 roofing stock at one cent a pound. Consumers of these rags are actively inquiring for supplies and are buying freely, and dealers are taking full advantage of the rather limited supply available to get higher prices. New white shirt cuttings also have jumped in price, sales to writing paper mills having been recorded at 10.50 cents per pound f.o.b. this city, while nearly all other grades of new cuttings tend strongly upward in value. Bleached canton flannels are particularly wanted, with sales to mills at 9 cents a pound, while light silesias, unbleached muslins, white lawns and light flannelettes have been in good call. Old whites are gradually moving to higher price levels and dealers now quote around 6 cents a pound for average quality packing of No. 1 repacked whites, and 4 cents for No. 2 repacked. Old thirds and blues show a rising tendency, with sales to paper mills reported at 2 cents per pound for repacked stock, and around 1.40 cents for miscellaneous blues.

PAPER STOCK—The situation in old paper is so strong that it might well be said the market is in a booming condition. Demand for most grades is quite pronounced and there have been sales noted establishing prices on much higher levels; in fact, consumers in some instances have paid prices for waste paper which have been surprising indeed when one stops to consider the levels at which wood pulp can be procured. Soft white shavings have sold out of New York this week at 3.75 cents a pound f.o.b. this city, which is the same price prevaling on No. 1 hard white shavings. This is the first time in a long, long time, it is stated, that soft shavings have been worth as much as hard shavings, which situation simply reflects the scarcity of and active demand for the former and the larger available supply and the neglect by buyers of the latter. Old heavy books and magazines have sold at 1.80 cents f.o.b. New York, and mixed books at 1.40 cents, both prices being new high ground for the present upward movement of paper stock prices. Folded newspapers have brought 65 and 70 cents a hundred pounds f.o.b. New York, No. 1 mixed papers 55 to 60 cents a hundred pounds, No. 1 container manilas 75 and 80 cents, overissue newspapers 95 cents, and white blank news cuttings 1.70 cents per pound.

OLD ROPE AND BAGGING—Old manila rope continues in good demand and prices on this article rule very firm. Dealers report paper mills freely paying 5.50 cents per pound f.o.b. shipping points for No. 1 rope, and there has been talk of sales up to 6 cents, which seem highly probable in view of the strength of the market. Old bagging shows little or no change and is wanted merely in routine amounts.

Scandinavian American Trading Co.

50 E. 42nd STREET
NEW YORK

CHEMICAL
MECHANICAL

KRAFT PULP

FOREIGN
DOMESTIC

ONTARIO
The Banner Province

BENIAH BOWMAN, Minister of Lands and Forests

Ontario has pulpwood areas practically illimitable, and offers a great field for those desirous of embarking in the pulp and paper making industry.

Ontario has innumerable waterfalls capable of supplying power for all manufacturing purposes, which are obtainable on reasonable terms, subject to development.

Ontario has large pulp and paper mills in operation at Iroquois Falls. Metagami, Ottawa, Sturgeon Falls, Spanish River, Sault Ste. Marie, Dryden and Fort Frances.

Ontario is traversed east and west by three great transcontinental railways, affording excellent transportation facilities.

Ontario's natural resources of mineral, pulpwood, timber and water powers are unequalled in the Dominion of Canada.

For full particulars as to Ontario's great resources and the advantages offered for large wood-using industries, apply to—

Hon. Beniah Bowman,
MINISTER OF LANDS AND FORESTS
TORONTO

MAIN BELTING COMPANY OF CANADA

The Main Belting Company of Canada Limited incorporated as a Canadian company in March 1910 with Mr. W. T. Plummer as President, W. McGeorge Vice President and Daniel E. Parker Treasurer and Managing Director.

During the last twelve years their sales of LEVIATHAN and ANACONDA Belting have increased to such an extent that they have found it necessary to equip a plant in Montreal for the manufacture of their belting in Canada. The same officers of the Company as at the original incorporation still remain in charge. The handling of their Canadian business always has been strictly Canadian and the decision to manufacture in Canada for domestic and export business is the result of plans made in their original entry into Canada.

MR. DANIEL E. PARKER,
Treasurer and Managing Director of Main Belting Co. of Canada,, Ltd.

Modern industry, because of its importance to mankind, the vastness of the field it covers, the infinite variety of its applications, the diversity of conditions under which these applications must be made and the ever changing nature of the conditions themselves, makes incessant and increasing demands upon the best that human intelligence can produce.

Innumerable problems have constantly to be solved, and none of them are more difficult and complex than those which arise in connection with belting. Without belting, industrial life, as it is to-day could not exist, for in the whole system of power transmission, nothing outranks belting in importance. It is thus evident that all questions regarding the selection and installation of belts require most careful consideration by trained experts.

Even in ordinary circumstances, where the difficulties to be encountered are chiefly mechanical, and where toughness and pliancy are the principal requisites of a good belt, there are many problems which require careful thought, but the difficulties to be overcome in such cases sink into insignificance compared with those encountered under the extraordinary conditions where belts often have to do their work.

Extremes of heat and cold, absolute absence of humidity, under-water conditions, fast and slow speeds, sudden increases and decreases of the ''load''; all these have to be taken into consideration. In addition, the destructive effects of abrasion, acids, gases and chemical action have to be overcome. Hence it is evident that, if costly mistake are to be avoided, a careful study of the conditions in each case is necessary before the belt is selected, and also no one belting will be able to give the same degree of efficiency on all the installations of all plants.

Leviathan-Anaconda belting is the result of an evolutionary process; it represents the prolonged labours of a host of expert chemists and engineers, and is a typical example of the survival of the fittest. In it are incorporated the results of many experiments and long practical experience in belt making.

It is the natural reply to the imperative demand for a belting of great strength and ruggedness, permanent pliancy and unfailing tractiveness, that can be depended upon to do its work satisfactorily, no matter what the conditions may be. Leviathan satisfies the demand where the question is one of mchanical difficulty, while Anaconda will give equal satisfaction where the conditions are abnormal.

The stretching of belting in service is one of the most troublesome things with which the user has to contend. Each Leviathan-Anaconda belt is stretched, in the Company's factory, in exact and definite proportion to its strength and the load it is intended to carry; it is likewise thoroughly ripened and matured. Hence it follows that these belts, when installed, possess the ability to deliver that load with a good margin of safety, under every possible working condition. ''stretch,'' with its destructive twin ''slip,'' has been practically eliminated.

Either Leviathan or Anaconda belts can be made endless if desired. After making, they are seasoned under tension so that the belt is just the right length and does not have to be altered after running a few months. Leviathan belting can be used anywhere and for any purpose, that ordinary belting is adapted to, with perfect satisfaction. There are certain special locations, however, where, on account of high temperatures, acids, fumes, etc., it would not be advisable to use Leviathan belting. For work of this nature, the Anaconda belt has been perfected. It is made on exactly similar lines to the Leviathan, but is processed so that it will withstand those extreme conditions under which it will have to do its work.

NORWEGIAN PAPER AND PULP MARKET

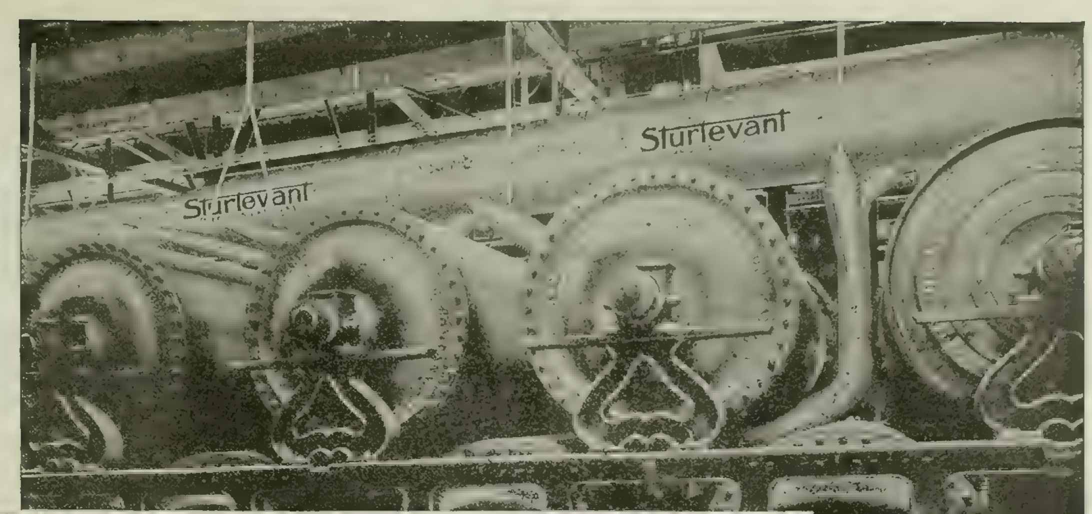
Activity in the paper market of Norway at the end of April had increased considerably. After the Easter holidays the demands for ground wood also became more active, due in some measure to decrease in buyers' stocks and to the effect of water scarcity in curtailing the output. At the end of April the market for chemical wood pulp had become quieter, except in the case of bleached sulphite, the demand for which remained practically unchanged.

On April 5 and 19, 1922, the Norwegian prices of wood pulp per metric ton were as follows:

Prime moist spruce pulp (mechanical)

	April 5.	April 19
Moist	$ 17	$ 17
Dry	38	38
Sulphite:		
Bleached	105	110
Unbleached, easy bleaching	59	62
Unbleached, strong	55	57
Sulphate:		
Easy bleaching	56	59
Kraft pulp	56	57

Conversions have been made at the rate of exchange prevailing on the day for which the price is given.



Sturtevannt Vapor Absorption System installed on a Two-Tier Machine at Haverhill Box Board Co., Haverhill, Mass. Front of machine showing how nozzle pipes cross in vapor pockets but are entirely out of the way of breaks.

National Folding Box & Paper Co., New Haven, Conn. The only source of drying coated cardboard is by a Sturtevant drying system over the festoons, the air being removed at the floor. The cleanliness is obvious.

VAPOR ABSORPTION SYSTEM

Removes all fog and vapor immediately it forms around the dryers. Gives increased drying capacity; dries whole sheet evenly with less heat; prevents drip from roof because of absence of fog; increases production.

AIR CONDITIONING

For creating any desired atmosphere with any temperature and humidity. For finishing rooms, storage or special process rooms.

Fuel Economizers for boiler plants; mechanical draft for boilers; calender blowers; engines motors; generating sets (either turbine or engine driven).

HEATING AND VENTILATING SYSTEM

For Beater Rooms; Finishing Rooms; Machine making light-weight stock; Grinder Rooms; Storage Buildings; Digester Rooms; and other rooms in shops which should be heated and ventilated.

Superintendents of paper mills are cordially invited to call on our Paper Mill specialists at all times. These engineers who have designed equipment for hundreds of mills may be of service to you without the slightest obligation.
Send for book "Sturtevant Apparatus in Paper Mills" — Free to Mill Superintendents.

Sturtevant
PUTS AIR TO WORK

B. F. STURTEVANT COMPANY OF CANADA, LTD.
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Barrett
Roofings, Cements
Industrial Paints
etc.

Save Money through Longer Service

MODERATE first cost is only the beginning of Barrett economy. Money put into Barrett Products goes farther—it buys greater durability, longer service and surer dependability. Each year sees an increasing use of these goods by railroads and progressive manufacturing concerns. A trial of any of the products described below will show you why.

Barrett Everlastic "Rubber" Roofing

Long recognized as the standard of quality, you can count on years of service from "rubber" roofing bearing the Everlastic label. Made from high grade weather-resisting, waterproof materials, it is backed by a seventy-five years' reputation for good roofings. In industrial districts where the action of smoke, steam and fumes combines with weather conditions, the superior durability of Everlastic Roofing is strikingly demonstrated. Yet its cost is moderate. Made in three weights — light (1-ply), medium (2-ply), heavy (3-ply). Nails and cement with each roll — 108 square feet to the roll.

Everjet Industrial Paints

Protective paints of proved value — a special kind for each special industrial purpose.
One of these—Everjet Penstock Paint—is made especially for use on metal or wood penstocks, and is used by many of Canada's largest pulp and paper mills. Like all other Everjet Industrial Paints it is proof against water, weather, alkalies and acids; is easy to apply, economical, and extremely durable.

Everlastic Liquid Roofing Cement

Adds years of service to worn-out "rubber" and other prepared roofings by giving a new watertight and weather-resisting surface. Fills up leaks and holes. Comes ready for use. Easy to apply, dries quickly and is economical.

Plastic Elastigum Patching Cement

Unequalled for stopping leaks in all kinds of roofs, for relining gutters, repairing flashings, etc. Can be applied to either wet or dry surfaces. It is tough, elastic, waterproof and acid proof. Comes ready for use. Don't be without it.

The Barrett Company
LIMITED

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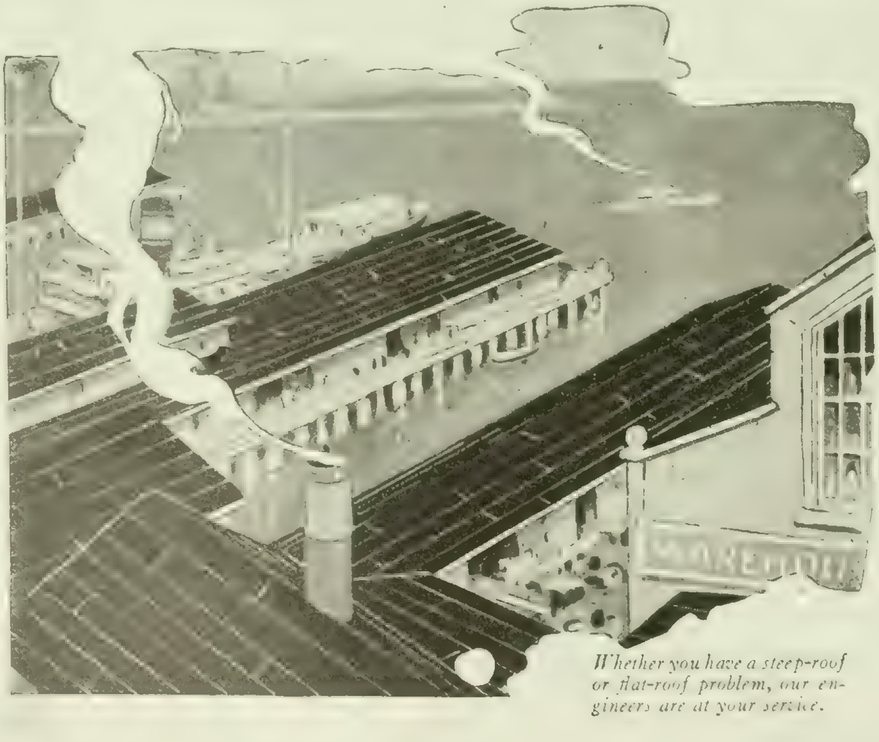


Whether you have a steep-roof or flat-roof problem, our engineers are at your service.

INTERLAKE
INDIVIDUAL
TOWELS

There is nothing more pleasant these warm days, than to have a soft white clean Towel every time you want to dry your hands or face. Every buyer should select a Towel which does the work at a low cost, and that does not antagonize the user by its harsh, non-absorbent qualities.

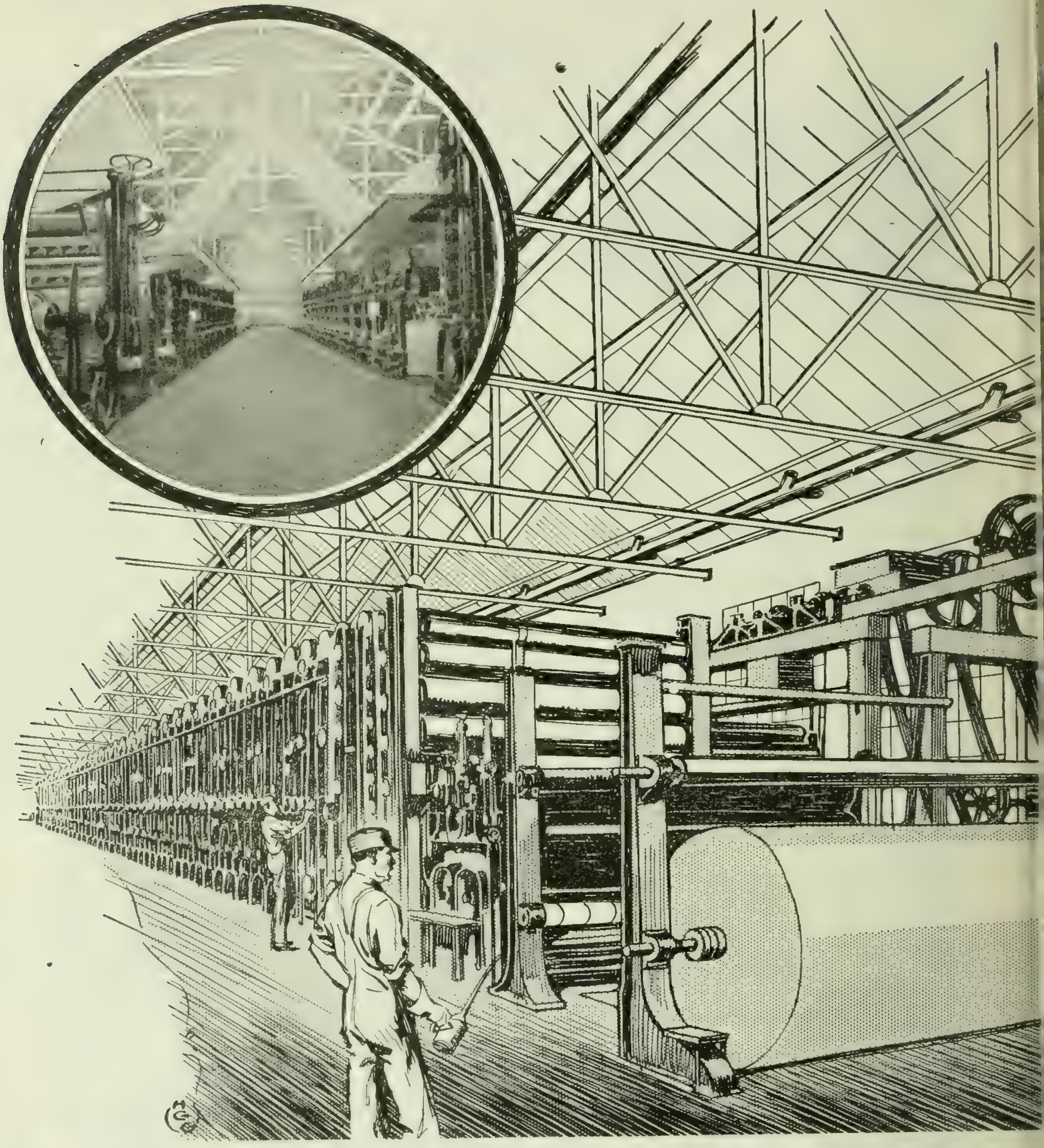
INTERLAKE
TOWELS
ARE PLEASANT TO USE

The INTERLAKE TOWELS are put up in packages of 150 Towels each, twenty-five packages in a case. The Cabinets for dispensing Towels are all metal, free from any mechanical parts, and very attractive in appearance, finished in either Olive Green or White Enamel.

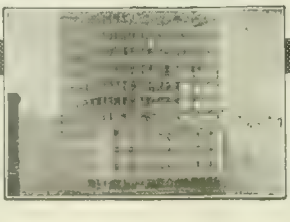
We have a liberal trial offer which should appeal to any interested buyer. Write for samples and quotations. You will be surprised at the low cost.

Interlake Tissue Mills Co.
Limited
MERRITTON CANADA

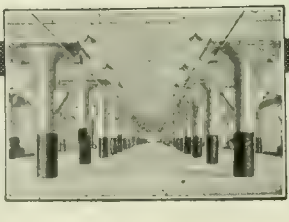
Head Office: 54 University Avenue, Toronto, Ontario.
Sales Branch: McGill Building, Montreal, Quebec.



DEGR

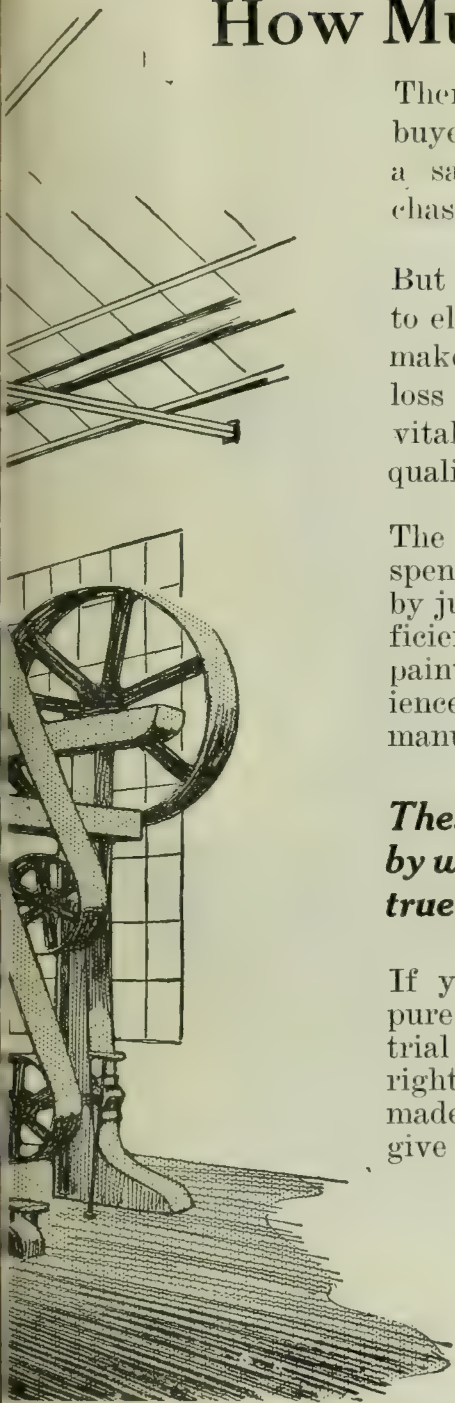


Superior Graphite Paint—*a protective coating for structural steel, bridges, metal roofs, stacks and all metal surfaces.*



Sta White—*a pure white, light-reflecting oil paint for industrial interiors. The mill white you can rely upon. It stays white*

Degraco Paints and Enamels—*made in all colors for use on interior and exterior surfaces, for every surface requirement.*



How Much Is Your Paint Dollar Worth?

There are times when every buyer feels that he must make a saving on his paint purchases.

But to avoid false economy — to eliminate the situation that makes for a saving today and a loss a year from now, it is still vitally important to look to quality.

The value of every dollar you spend for paint is determined by just two factors of paint efficiency — the records of the paint in service — the experience and reputation of the manufacturer.

These are the only guides by which you can judge the true worth of any paint.

If you buy **Sta-White** — the pure white oil paint for industrial interiors, you buy downright good paint. It is not made to sell at a price that will give you a false initial saving. No quality product is. It is made to fit a service. Its price per gallon is not high and its per year cost is always low.

You need not take our word for it that **Sta-White** will give you service, because it has a demonstrated value in the paper mill field that eliminates likelihood of failure. And back of it stands the reputation of the Dominion Paint Works Limited as makers of good paint over a long period of years. It is that, that constitutes a real guarantee.

Write for copy of our book, "Paints for the Paper Mill."

STA-WHITE is one of the Degraco line of dependable paints. Sold through branch offices with warehouse stock in all principal cities.

DOMINION PAINT WORKS, Limited

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Degraco Paints, Varnishes, Enamels
WALKERVILLE - CANADA

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STA-WHITE MAKES THE DIFFERENCE

ACO

PAINTS
VARNISHES
ENAMELS

Degraco Brick and Concrete Paints — *for interiors and exteriors Concrete Walls, Floor Hardener, Damp-proofing.*

Degraco-Tone *an oil paint in flat finish for interior use on Plaster Walls, Woodwork, Wall Board, Concrete, Tile, Metal.*

Degraco House Paints—*all colors for exterior and interior surfaces. High quality and durability assure low ultimate cost.*

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(KNOT SCREEN)

For all kinds of Stock. Will remove uncooked knots without breaking them.

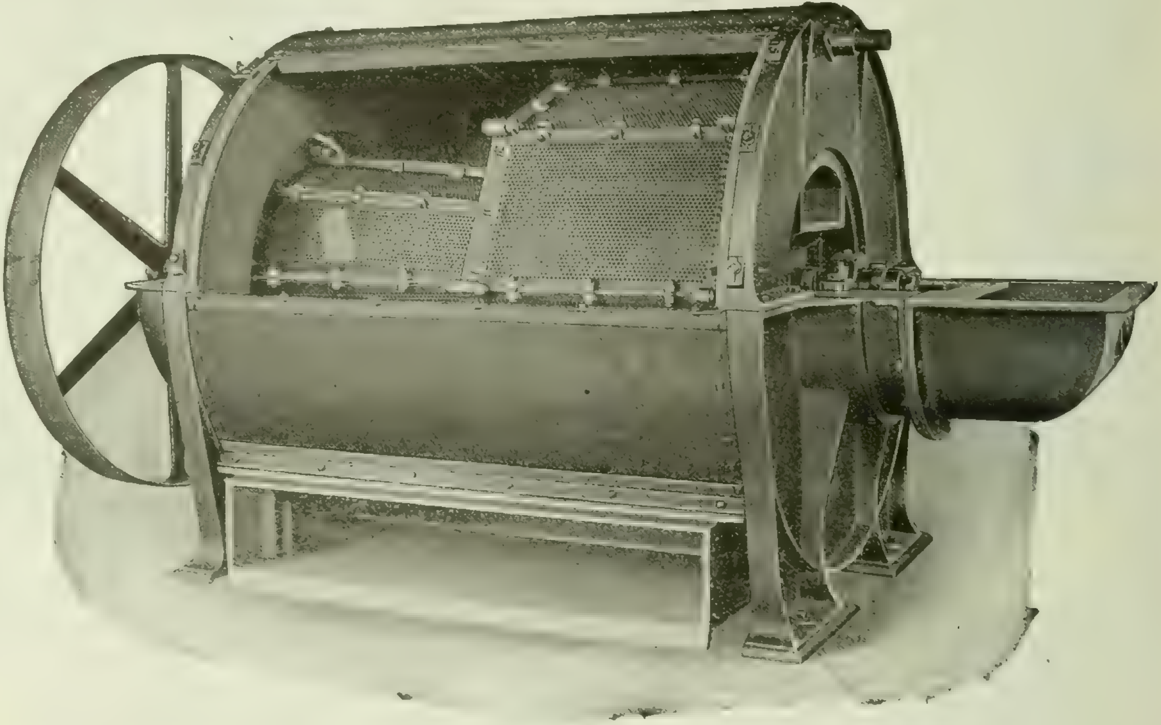
Bearings only subject to mechanical wear

Single Belt Drive, No Packings,
Quick Detachable Plates

Capacity up to 50 tons

Less than 1 h.p. per Machine

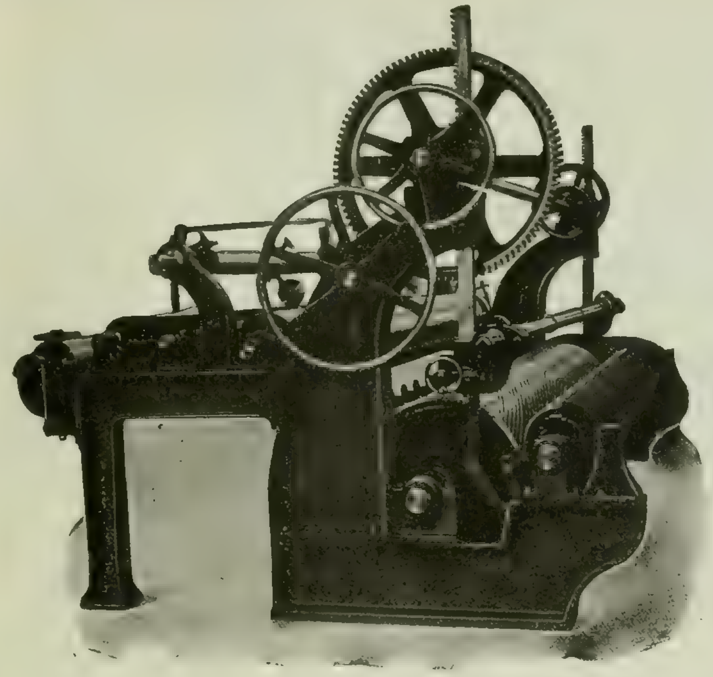
PERFECTION



Use this Machine ahead of Your Ground Wood Screens

Removes Coarse Waste
Improves Quality
Very Large Capacity
Power Saved
= DIVIDENDS

Sherbrooke Machinery
Company Limited
SHERBROOKE - QUEBEC



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WARREN
PATENT
DOUBLE DRUM
WINDER
With Slitter Attachment

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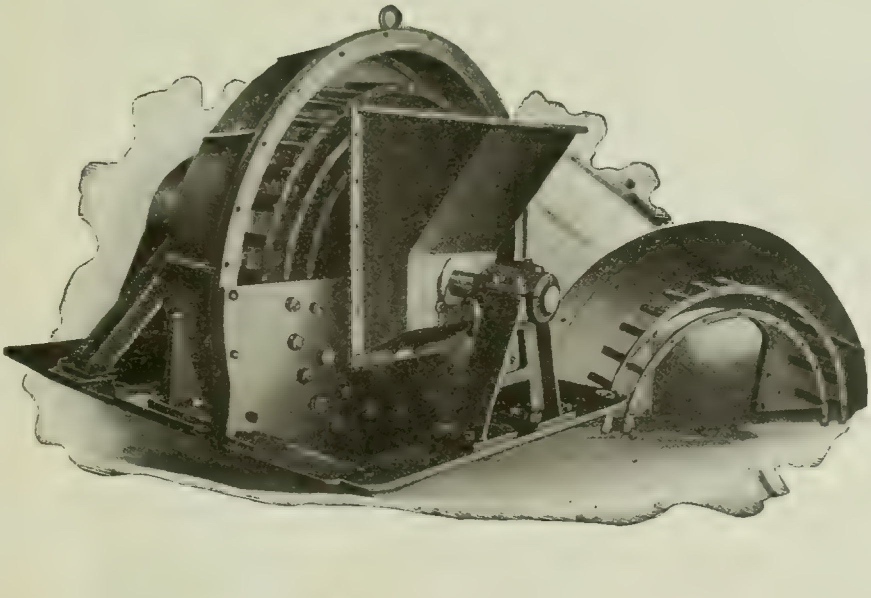
TICONDEROGA, - N.Y. U. S. A.

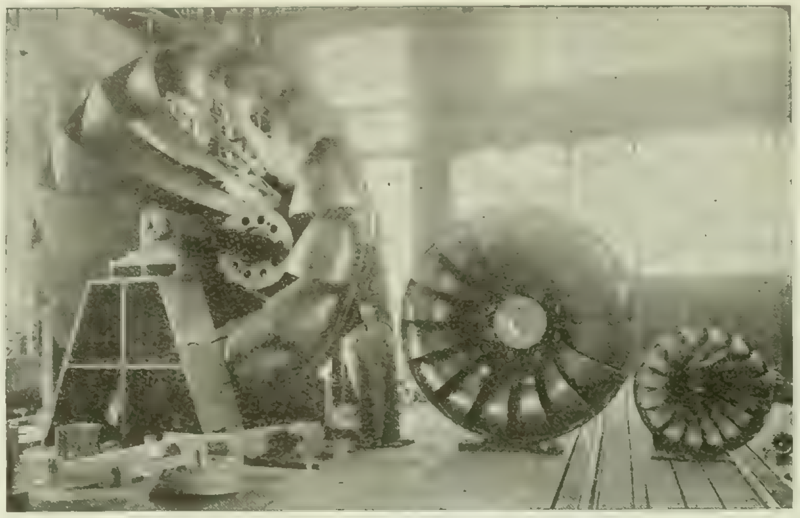
THE CARTHAGE CHIP CRUSHER



NOT
A PULVERIZER
Critical mill men know the difference

The Chipper People

Carthage Machine Co., Carthage, N. Y.



Balancing I P. Morris Turbine Runners

I. P. Morris Turbines

Make Dependable Power Units for Pulp and Paper Mills.

They are specially designed for the conditions under which they will have to work, thus securing the highest efficiency practicable, in many cases over 90% **from half to full power.**

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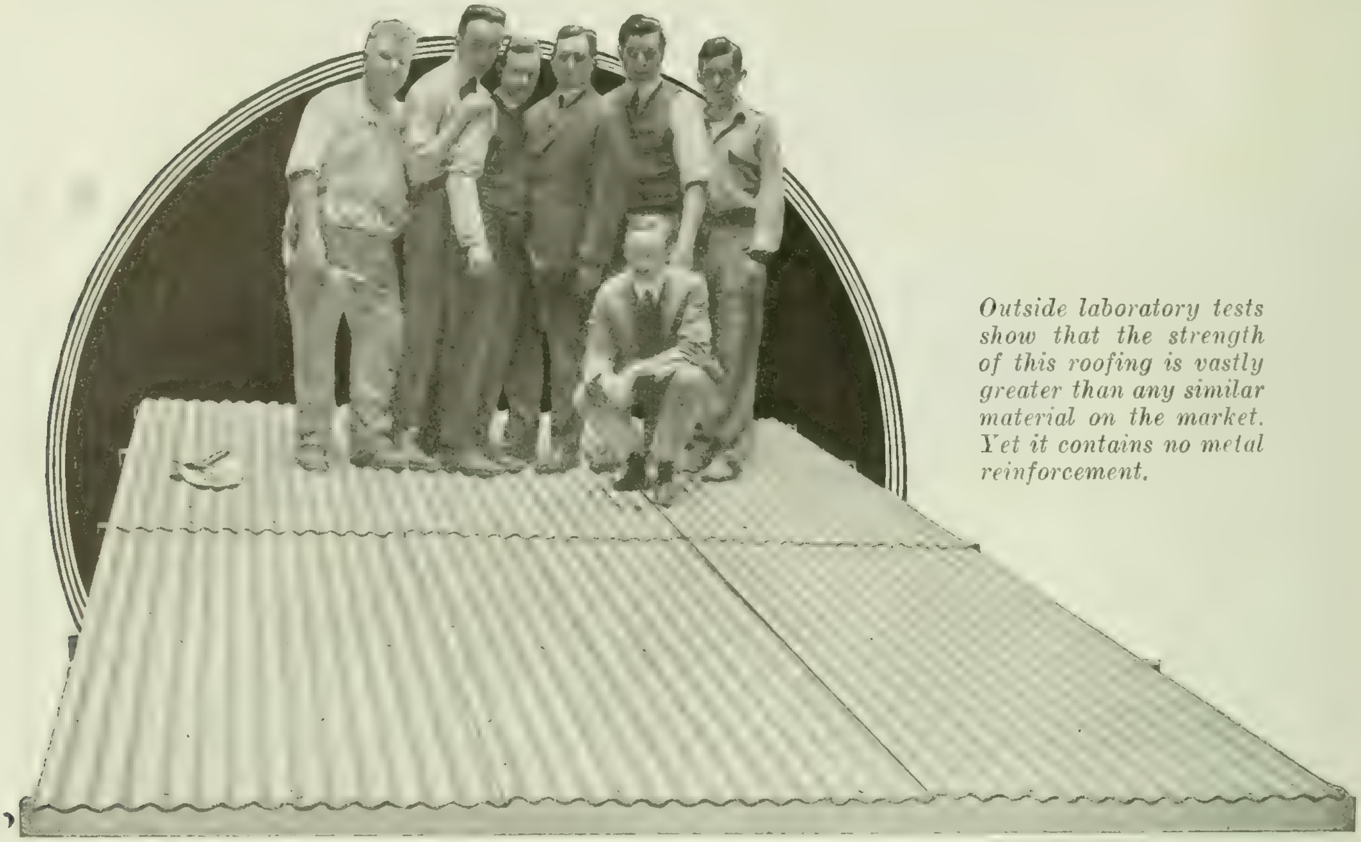

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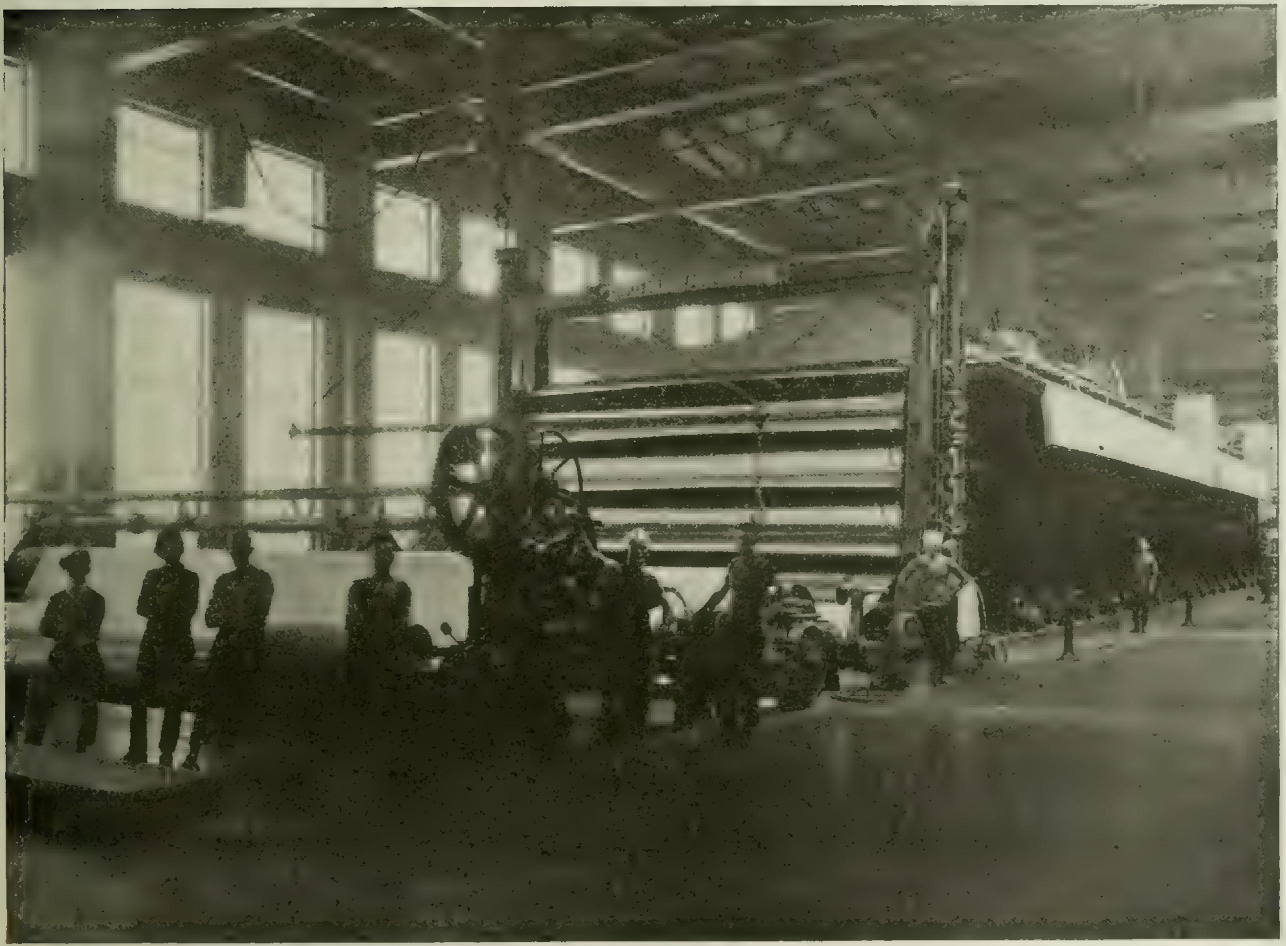

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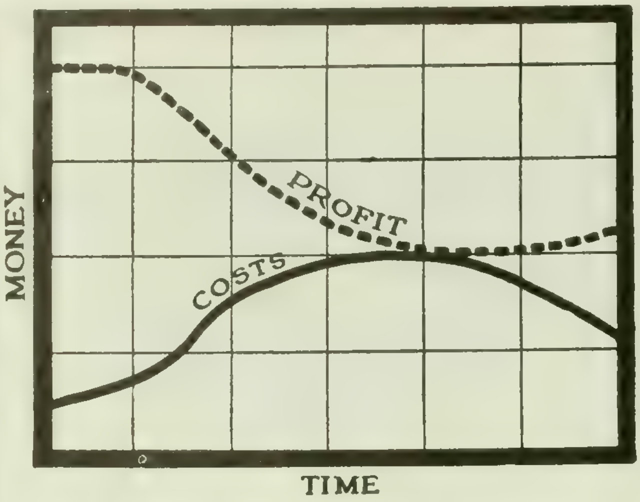

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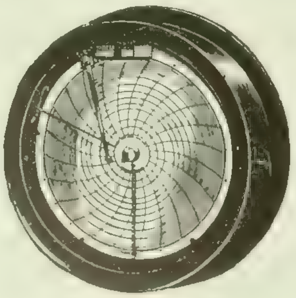

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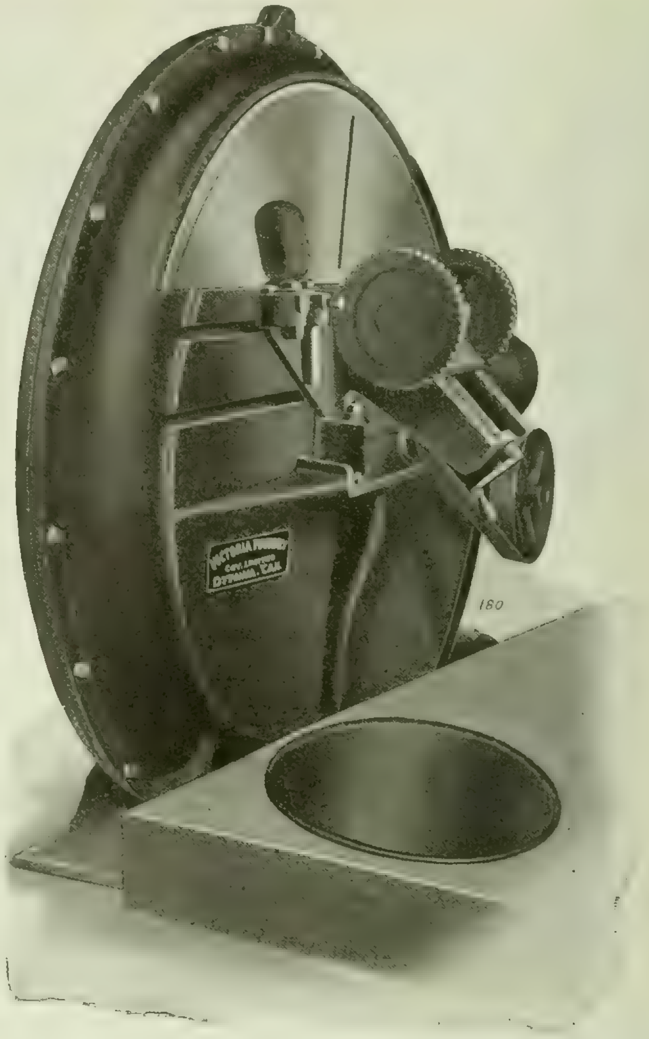

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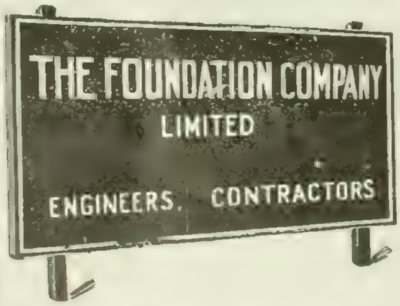

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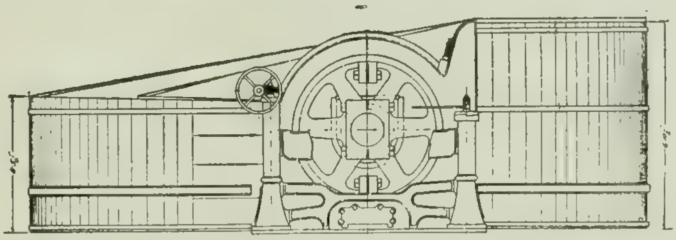

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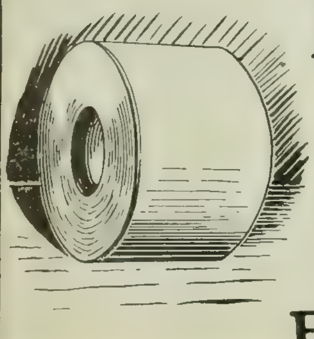

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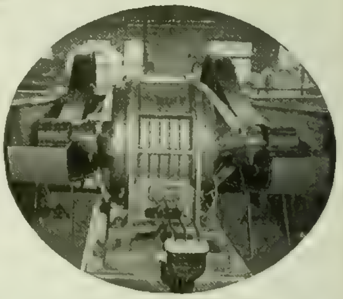

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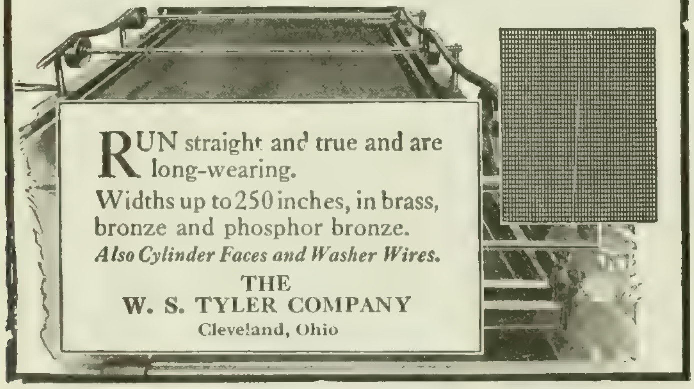

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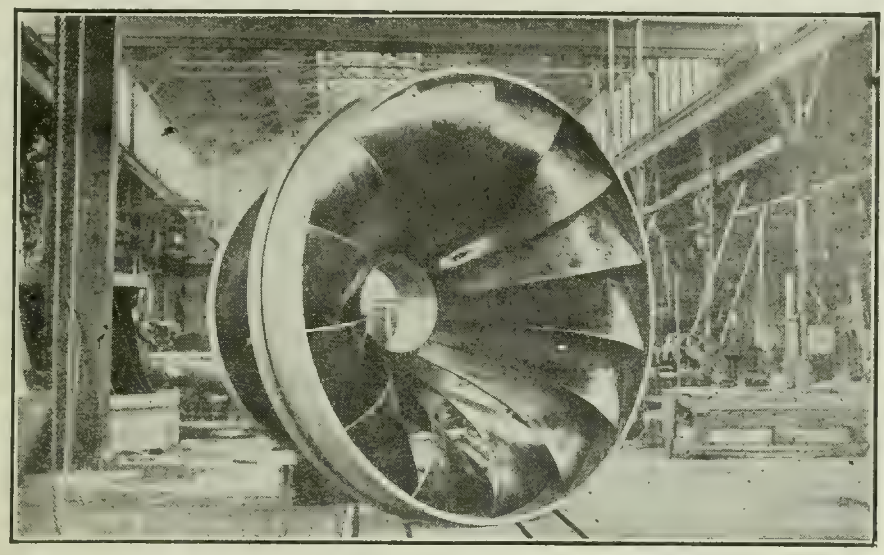

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A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XX. Gardenvale, P. Q., June 29, 1922 No. ~~25~~ 26

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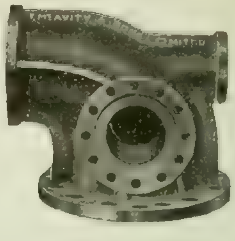

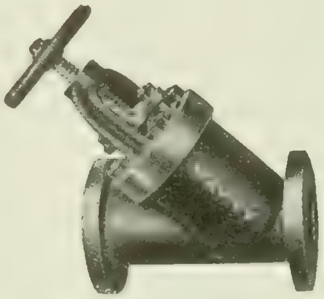

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:-: EDITORIAL :-:

DESERVED PRAISE

Last week the Technical Section of the Canadian Pulp and Paper Association went to Iroquois Falls at the invitation of the Abitibi Power and Paper Co., for their annual summer visit of inspection. The committee in charge had anticipated an attendance of possibly 15 or 20. They felt very much elated on having 34 in the special Pullman which gathered in the members uniting at North Bay from Montreal and Toronto and the West. The ears of the management had reason to burn continuously from the time the party arrived at the Falls. The kindness and courtesy of the company was even evident at North Bay where three representatives of the company met the technical men as an advance escort.

The editor had made three previous visits to Iroquois Falls and each visit finds the mill and the town more complete and more attractive. Operating at maximum speed, the Abitibi mill is the biggest single news print unit on the continent, with the Great Northern Paper Co., at Millinocket, Me., a very close second. It is not, however, the enormous capacity of the plant, housed in the massive concrete structure on the banks of the Abitibi River, which is the most striking feature of the development. Even more impressive than the great manufacturing plant is the spirit of kindliness and cooperation which pervades the whole place. There is, too, a feeling of efficiency which is almost tangible; the houses, the layout of the town, the comfort, convenience and contentment evident everywhere, make it hard to realize that this community stands on what a few years ago was a dense forest. Nothing can be more attractive than the appearance of Iroquois Falls in June. The macadam roads, the parks with lawns and shrubbery, the well-kept houses with gardens and green grass, with their flowers and shrubs make it look more like a fairy village than a manufacturing town. The mill seems almost incidental and surely it is a surprise to learn that Iroquois Falls has more than 2,700 inhabitants and that there are 1,125 on the payroll of the paper mill.

In keeping with this delightful spot is the spirit of hospitality that pervades the whole place. Evidence of this is the delightful way in which the visitors were all entertained at dinner at the homes of those living at the Falls. Some of us had never met our hosts before, some found opportunity of breaking bread with old friends and renewing old acquaintances. It was a delightful experience which, combined with the pleasure and benefit of visiting such a well ordered plant, made the summer trip of 1922 certainly the most successful of the series which has now

(Continued on page 548.)

The thanks of the Technical Section and through them, of the various concerns represented, cannot be too heartily extended to the Abitibi Power and Paper Co., for their very generous hospitality and for the very helpful visit that we had. The program and all arrangements were made with the greatest care and there was not a single hitch. Somebody had even sent the weather man a box of cigars so that the two June days that we passed in Northern Ontario could not have been surpassed.

EFFICIENCY IN INDUSTRY

The revival of business should emphasize the need of individual efficiency in industry. Such is the view of Mr. S. W. Strauss, the president of the American Society for Thrift, and there will be few who are brought into constant contact with businesses, both large and small, and who have the opportunity of observing the waste which, in all too many instances, characterizes their operation, who will be disposed to quarrel with that view. Mr. Strauss goes on to say that, although American business is conducted with extreme aggressiveness and intelligence and the American business man is a dominant force in the affairs of mankind, there are glaring instances of waste in industry which should be an incentive to each of us to make every effort to increase the efficiency of our own work. We have little doubt that most of this applies with equal force to Canadian as to American business men and business methods.

Economy should conduce to the efficiency of an industrial or commercial organization as a whole. Reduction to a minimum of unnecessary expenses makes not for the diminished, but for the enhanced, efficiency of the organization. During the last year and more, practically every business enterprise in Canada has been endeavoring to reduce expenses. In some cases, the reductions have been accomplished in a manner which so far from impairing has actually increased the efficiency of the enterprise. But in many—far too many cases—the reductions have assumed one, or both, of two forms, either of which is extremely likely to turn out, in the future if not in the present, a bane instead of a boon to the enterprise which has succumbed to its temptation.

In the first place, in countless business enterprises the reductions have taken the form of a blind discharging of employees. Some concerns have even gone so far as to seriously compromise their future by discharging key men and leaders while retaining less experienced and less competent men solely because they were apparently cheaper. Sometimes this has not been the fault of the management, but the discharges were made in response to orders from a board of directors who could see only the pay roll and not the other side of the ledger. The pay roll can be seen, but often the methods of effecting real economies are "Out of sight and out of mind" and the future is left to take care of itself.

In the second place, there has been a determination on the part of many business concerns to attack their advertising appropriations with a hatchet, as it were, and practically regardless of consequences. At a time when orders need going after with all the vim and vigor available, concerns which act after this fashion are really — however those in control may seek to disguise the fact from themselves — letting up on their salesmanship. They have cut down on their advertising — their necessary and essential advertising — as they have discharged indispensable employees because such a mode of retrenchment, in each case, looked easy and likely to show immediate results. Such a policy is one of almost patently false economy. That it is one of false economy cannot be seriously doubted. Indeed, in all probability, nine out of every ten business men are ready to assent to the statement that advertising is an essential of present-day business, and even to the further statement that it is more essential when orders are hard than when they are easy to get. Yet so widely does practice often differ from theory that many a man who is ready to profess himself a firm believer in the uses of advertisement will be among the first to chop and lop his advertising appropriation until he makes it (and, in some cases, almost literally) look like thirty cents. Yet there is probably no concern so favorably placed that it can afford radically to cut down on advertising expenditures deliberately adopted. A sharp reduction in the advertising of nationally distributed articles, the reputations of which were apparently so firmly established that nothing could affect them adversely, has been followed by a heavy falling off in sales with the regularity of clockwork. To win a place in the crowded and besieged mind of the modern man is not equivalent to holding such a place. It is more like creating a melody which the prospect hears, enjoys, and inevitably forgets. It must be played and re-played, or other melodies will take its place. Not even the greatest corporation or the most popular product can hope to build up a reputation which will of its own force endure. The history of advertising is filled with striking proofs of human forgetfulness.

Yet the very concerns which show themselves the readiest to discharge indispensable employees and to effect the most drastic reductions in no less indispensable advertising are among the last to take account of those losses which are "Out of sight." The losses at many factories, for instance, which arise from starting work late—both in the morning and also after lunch—and stopping work early can easily run into very large figures. Then there are the delays between jobs, each perhaps small in itself, but large in the aggregate. In many factories, too, the belts, motors and other drives are given insufficient attention, and failures, causing losses of time, are numerous. Materials also furnish a fertile field for invisible losses which may arise from reduced prices, spoilage, poor design, theft, excessive cost, obsolesence, and too large a stock. The last item is an indirect loss, but may actually cripple a business by tying up capital. Then there are power losses due to transmission lines, shafting, belting, gears and pulleys; and still other losses due to poor combustion, improper supply of air, poor grates, faulty furnace construction, extravagant use of fuel, steam leaks, uncovered steam pipes, waste of water and unnecessary burning of lights or the use of superfluous lights.

The foregoing are just a few samples of the "Out of sight" losses which occur in so large a number of factories, and nearly all of which can be enormously reduced.

For real, as distinguished from false, economy goes hand-in-hand with efficiency. Outside the industrial plant, as well as within it, losses to industry through individual negligence are of the most startling character. It is said, in regard to the waste in connection with the shipment of eggs, that not more than six eggs, out of every ten laid, ever reach the consumer. Less than one half of the trees cut from the forests reach the consumer. The waste in mining is of huge dimensions. So are the losses from fires that arise from avoidable causes. And so the tale goes on. Thriftlessness and slip-shod methods are among the greatest impediments to industry today in our own as in other lands. They can be eliminated, and they must be eliminated, if individual efficiency in industry is to be any more to us than a mere catchword.—A. R. R. J.

BUILT PAPER MILLS, WAS BEHEADED

Edward Gibbon before whose shrine we burn incense because he wrote the *Decline and Fall of the Roman Empire*, says in his *Memoirs* that James Fienes, Baron Say and Seale, aond Lord High Treasurer of England in the reign of Henry the Sixth, was one of his ancestors. This lord, together with his son-in-law, Cromer, was beheaded after a mock trial by Kentish insurgents.

The notorious Jack Cade is reported to have summed up the sins of his victims in these words:

"Thou hast most traitorously corrupted the use of the realm in erecting a grammar school; and whereas, before our forefathers had no other books than the score and the tally, thou hast caused printing to be used; and contrary to the king, his crown and dignity, thou hast built a paper mill. It will be proved to thy face that thou hast men about thee who usually talk of a noun and a verb and such abominable words as no Christian ear can endure to hear."

Gibbon himself says that the art of printing was not introduced into England until several years after Lord Say's death, so that after all he may not have been guilty of the crime of being a printer and owner of a paper mill. Perhaps those of you who are operating paper mills today may take your rights and privileges too much as a matter of course. It might be a good thing to have a few Jack Cades scattered around just to make all of us feel that in being compelled to pay our income taxes, we are getting off lightly.— Lombard News Letter.

A lot of fellows who long for the brotherhood of man never had a big brother.

The Pulp Industry At Weymouth

By Arch Beeton

Weymouth, a pretty village with a population of a little less than a thousand souls, possesses two great industries; viz., the lumber and pulp industries. For the size of the place there is no doubt that the volume of business which these two industries create, surpasses many a larger centre and reflects credit on the wide awake up to date business men of the locality. Surrounded by a large country district, where timber and pulp wood grow in abundance and where large quantities are cut, and situated close to railway and water transportation facilities, Weymouth is naturally located for the pursuit of its two chief industries. For many years and even today (although the market is low and the outlook not very promising at the present, but which is bound to better with time) the lumbering industry has been perhaps the chief industry. In days gone by it was a customary sight to see, two, three, four and even more huge barques, barquentines; brigs and vessels at the wharfs taking on large cargoes of timber which was being exported to the West Indies, American points and even to ports in South America. But gone are those days, days that were so full of activity and business in the timber line. Still in spite of all the fluctuations of the market, in spite of the decrease in the expoprtation of lumber, timber is being cut this year in large quantities.

One day about twenty-seven years ago a man from Philadelphia was enjoying a fishing excursion on the Sissiboo River, with its many tributary streams. He came to the little falls, known as Sissiboo Falls, on the river and the powerful run and fall of water impressed him. He saw a splendid chance for a pulp mill. He followed the river a little further on its course and saw where thirty-five lakes were flowing into that same river; saw, too, an abundance of thrifty growing timber of the finest quality for making spruce pulp, that bordered these lakes and the numerous little streamlets. A few short miles away was the railway and down the river, a few miles distant was tide water, which made transportation an easy matter. The following spring he made another trip to this delightful little spot, with his mind fully determined on its course of action.

Mr. S. Fawes Smith, for such was this gentleman's name, on his own initiative, purchased land and erected a three grinder pulp mill, with four wet machines and shortly after the mill was erected and operating, four grinders and five wet machines took the place of the first installed. A Crabb dam was built over the natural falls making the head of water forty-five feet. A very successful little business was carried on through the local manager, F. M. Steadman who later moved to Digby where he entered the furniture business. A general store, for the accomodation of the workmen and nearby residents office, cook house and boarding houses were erected, transforming the once quiet woods scene into a busy, thriving centre. Mr. Smith purchased many acres of timber land from the Crown and from private owners, about ten thousand acres in all. There were about 60 to 100 men employed at the mill and in the woods, with an average wage of from seventy-five cents to a dollar per day. In some cases for the more expert workmen, a dollar and a half per day was paid. The pulpwood purchased cost Mr. Smith about four dollars per cord, which in those days was considered a good price, by the sellers. The mill's capacity was 28 dry tons per twenty-four hours. Practically all the pulp manufactured in the days of Mr. Smith was shipped via rail from Sissiboo Falls Station, which was not far distant, to American mills. Mr. Smith operated his pulp mill at Sissiboo, or as it is more commonly called, the Upper Falls for a considerable time and did a flourishing business. The probable cost of the mill erected by Mr. Smith, together with the other appurtenances, was within the sum of a hundred thousand dollars.

After Mr. Smith had conducted his business for a few years he was bought out by a company formed by Mr. Charles Burrill, at that time one of the greatest business men of Weymouth, and who with his brother, Israel Burrill, conducted a large general store with a good trade, Mr. Burrill was profoundly interested in the pulp industry and foresaw great possibilities and so formed a syndicate at Montreal, which purchased the interests of Mr. Smith. The syndicate inaugurated the Sissiboo Pulp and Paper Co., which for a short while did a greater business than did Mr. Smith, but which finally went under. The new company greatly increased the output of the mill built by Mr. Smith by installing a new water wheel, new grinder, two extra wet machines and hydraulic presses. With business steadily improving the new company built another large mill at the Lower, or as it is more familiarly known, Weymouth Falls. This mill was a six grinder plant, with six wet machines and hydraulic baling presses and had a capacity of 60 moist tons per twenty-four hours.

A large dam was built over the lower falls increasing the head of water to 60 feet and giving a total water power of about 3000 horse power. The new mill and dam cost the new company about $250,000. The dam was built by the Engineering firm of Messrs. Eaton and Brownell of Watertown and still exists. The dam gave the company a great volume of water for the operation of their mill and the water was conveyed from the pond to the four turbines through a large steel flume. An up to date saw mill was also built at the dam site for the purpose of sawing the lumber and timber for the new plant as well as for the cutting of the material used in the construction of a large store, cook and boarding houses, extensive warehouses, docks and offices. The company planned the output of the two mills it owned, to produce 120 moist tons per day of twenty-four hours, a figure it never reached.

Shortly after the construction of the new lower mill, the dam at one of the upper lakes gave way. The breaking of the dam added force to the freshet with the result that one end of the dam at Weymouth Falls, was gullied out, releasing a huge body of water right on to the new mill. Large quantities of freshly made pulp were washed away and considerable damage done. This loss together with the enormous expense the company had gone to in the erection of its new mill and low market which prevailed at that time, forced the company to close its mills.

Altogether the Sissiboo Pulp and Paper Co. operated their mills two or three years. The lower mill was practically a complete failure but the upper mill contnued to turn out good pulp. In fact had it not been for the continued operation of the upper mill the loss sustained by the Sissiboo Pulp and Paper Co. would have been much greater. The Sissiboo Pulp and Paper Co. acquired thousand of acres of land and employed in the woods and at the two mills, about 200 men. The wages of the employees ranged from $1.00 to $1.75 per day. Carl Dennis, now of Rhodes Curry Ltd., Amherst, was chief bookkeeper for the company and Harrison Jones, at present with the Sissiboo Pulp and Power Co. was also in the office. The cost of manufacture increased somewhat from the days of Mr. Smith and pulp sold from $16.00 to $22.00 per ton, a price then scarcely even dreamed of.

After the cessation of the operations of the Sissiboo Pulp and Paper Co. Mr. Charles Burrill retired to other fields of business activity. His brother Israel, after conducting the general store for a while, also went out of business and entered the employ of the I. C. R. with offices at Moncton. Both these gentlemen, who have left an indelible impression on the business life of the community, have since departed this life.

In 1904 an enterprising citizen, Mr. G. D. Campbell who was then doing an extensive lumbering business, with the assistance of a Montreal friend, Mr. George Khol and the Royal Bank of Canada took over the property of the Sissiboo Pulp and Paper Co. and formed the Campbell Lumber Company with a capitalization of $75,000. The new company consisted of G. D. Campbell, Sr., President; G. D. Campbell Jr., Vice-President and Secretary; H. P. Filleul; asst. Vice-President and secretary; and Glidden Campbell, General Manager, with the following directors; G. D. Campbell, Sr.; Donald Kemp, H. P. Filleul and Glidden Campbell. The newly formed company successfully operated the property for two years as a lumbering concern. The lower or Weymouth Mills Pulp Mill was repaired and put into operation with the assistance of Mr. Stillman Jones, who, as a young man, learned the business in Smith's mill. A modern band saw mill was a built by Mr. Campbell adjoining the pulp mill and the slabs from the saw mill were utilized in the manufacture of pulp. The heart of the timber was sawn into lumber and the slabs made into pulp. This proved a valuable aid as there was no wastage, everything being conserved and utilized, even to the edgings from the sawed timber. It was a far sighted scheme and proved a mighty factor in the operation of the plant. With this scheme in working order Mr. Campbell was early enabled to defray the expenses incurred in the erection of the band saw mill as well as to pay off the expenses of repairing the lower mill.

Sissiboo Valley, and Mills of Sissiboo Pulp & Paper Co.

Just as things were beginning to hum and business was on a good sound footing, with a promising market and reasonable rates of exportation a disastrous conflagration destroyed the saw mill and the pulp mill in 1911. The fire originated from the electric dynamo shaft of the mill. The company had very little insurance and the loss by fire was heavy and sorely felt. But Mr. Campbell was not daunted or dismayed. He immediately set about the erection and construction of a new mill on the old site. He installed more modern machinery, and the pulp mill was erected on the foundations of the old one that was burned. The new mill had the same capacity as the old one. After he built the new mill Mr. Campbell operated the business solely for pulp manufacture until 1914 when the war broke out and six of his sons, who were connected with the business answered the call of their King and Country.

In spite of the great handicap sustained in the loss of his sons, Mr. Campbell continued to run the plant until the year 1918 when he decided to dispose of some of his interests to a large British concern that was to take it over on shares. But shares were thrown aside and after considerable dickering a company, the Sissiboo Pulp and Power Co. Ltd. leased the lands and the mill and are operating the plant solely as a pulp business at the present time. During the time the Campbell Lumber Co. was operating the business, the dam was repaired and large tracts of timber lands were acquired. The storage of water at the lakes was also increased. The Campbell Lumber Company employed from 200 to 300 men in the woods and at the mill. Employment was given a large number of men with teams as a lot of the pulp was hauled from the mill to the wharves of the company at Weymouth during the winter season as well as during the summer. The Company also purchased scows and much of the manufactured pulp was scowed down the river to the wharf at Weymouth North where large steamers carried it to the markets. About thirty dry tons were manufactured daily. The purchase price of pulp wood was a little higher than in previous years as were the wages, which ranged from $1.50 to $3.00 per day according to the work done. The upper or Sissiboo Falls mill was not operated by the Campbell Lumber Co. which devoted all its work to the lower mill. During the later years of operation by the Campbell Lumber Co. the plant was not run on full capacity. The new machinery installed, the higher price paid for wood and the wages made the cost of manufacture a little greater, but this was well offset by the greater increase in the selling price of the pulp.

North Weymouth, N. S., Shoiwing Docking Facilities

Mr. G. D. Campbell, Sr. has practically retired from active business but still retains a profound interest in the pulp industry as well as in anything that tends to the betterment of his home town. The acquirement of timber lands; the cost of building a new mill together with the coming of the war were the chief factors in the disposition of interests held by Mr. Campbell to the British concern. Large exportations of pulp were made by the Campbell Lumber Co. to New York and Atlantic ports and for a time the village was a regular bee hive of industry. Since the Sissiboo Pulp and Paper Co. ceased operations the upper mill has not been used and is gradually going to decay. At the upper falls where the industry was first established by Mr. Smith there exists a splendid opportunity of a hydro power plant and even an additional pulp mill if desired. It is to hoped that some day in the not far distant future a hydro plant will be installed there, as the want of one is urgently felt.

For a short while before Mr. Campbell disposed of his interests, a Mr. Evans, of Halifax, took over the business on lease and operated the plant for a short time. However, the Sissiboo Pulp and Power Company Ltd. soon obtained the lease and a Mr. R. A. McIntyre of St. John was sent here as Manager of the new company. This company is under the control of the Becker Company of America Ltd. of Halifax, which is controlled by the Becker Co. of London, England, of which Sir Frederick Becker is the principal owner and shareholder.

It was in May of 1918 that the Sissiboo Pulp and Power Co. began repairing the plant of the Campbell Lumber Co. New machinery was installed; the plant was enlarged and a new and larger boiler put in. The new company which is under the direction of I. H. Mathers of Halifax, who is the managing director of the Becker Co. of America, went to great expense in putting the plant in operation. Several months were spent in repairing the mill and several expert machinists and mechanics were engaged to install the new machinery and put the mill in working order. With the coming of the war the cost of material went to sky rocket prices and this high cost continued for a considerable time after the termination of the war. As soon as things were ready the mill began operations an a small scale which was gradually increased until today it has a daily output of 40 dry tons and will soon, with the addition of more hydraulic presses which are being installed, have a daily capacity of 45 to 50 dry tons. While the mill was getting into shape the company purchased huge quantities of pulpwood, at a good figure, from the people and from outside places. This starting up of the old industry gave an incentive to the business. Owners of woodland were cutting spruce pulpwood and hauling same to the mill. Besides purchasing wood the company has, since taking over the business, bought considerable timber land.

The mill has at present, 6 grinders, 8 wet machines, and 4 hydraulic presses. Another will be installed at an early date. The company employs about 150 men at the mill and in the woods. In connection with the mill they have a large general store for the benefit of the employees; large, roomy cook houses and offices. Mr. Arthur C. Hatt, formerly of the Clyde Pulp Co. is the mill superintendent and H. E. Wagner, one of the best lumbermen of the county, has charge of the wood department. Much of the wood used is rafted down the lakes, streams and river to the mill pond. About 60 cords of wood are ground into pulp daily, it requiring about $1\frac{1}{8}$ cords to the ton. Since the plant resumed operations it has been running night and day and the company has made several large shipments of pulp. The first shipment was made in July 1920 when about 850 tons was shipped by rail to Halifax, thence by steamer to the old country. Onother shipment was made in January 1921 of 2,600 tons; in April 3,500 tons were shipped by rail to Halifax. All these shipments were hauled from the mill to the station at Weymouth. This afforded a great deal of employment to a number of team owners and men. The Sissiboo Pulp and Power Co. induced the D. A. R. to build a spur of railway from Doty's Crossing to the pulp mill, a distance of approximately two miles. Cars of pulp are loaded at the mill and hauled to the crossing where they await the first freight, and car loads of pulpwood, which the company buys along the railway, are hauled from the siding to the mill to be ground into pulp. In December last the S.S. Keyingham, belonging to a steamship line controlled by Mr. Becker, arrived at Digby and a shipment of about 3,100 tons made from this mill, the balance of the cargo being made up with pulp from Port Clyde Pulp Mill which is also controlled by the Becker Co. and from the mill at Chicoutimi, P.Q. In January 1922 the S.S. Domira, another of the Becker Steamers arrived at Digby and loaded about 1,600 tons that were manufactured here. In the month of March the Keyingham returned for another cargo and 2,500 tons, or 25,000 bales, were taken on board. All of these shipments were made by rail to Digby.

The company has a considerable amount of pulpwood on hand, enough for about 2 years' operation, and they are daily buying more. It is supposed the plant will be in operation for at least 10 months of the present year. The lake dams have been repaired and in places new ones built, so that the volume of water which will be available will be sufficient to keep the mill going for that length of time each year. There is enough water power both at the lower and the upper falls to run two pulp mills, if necessary, electrify the railway from Yarmouth to Halifax and operate other industrial factories. There would mean employment for experienced workmen; it would enlarge the population and it would be, undoubtedly, a benefit to the community. Perhaps the Pulp Co. will some day install an electric light plant. If ever this is done they will receive the blessings of the townspeople. There is an abundance of hard wood growing back in the country. It is not difficult to get this and a furniture factory could be operated here for years and years without eating up all the available material.

CHEMICAL EXPOSITION A BIG MARKET PLACE

Realizing that only a broad buying movement throughout all branches of the chemical, chemical equipment, and chemical consuming industries, will give the business an impetus which it needs at this time; the plans of the 1922 National Exposition of Chemical Industries, which will be held Sept. 11th to 16th at the Grand Central Palace, New York, are being laid with the avowed purpose of concentrating every effort to start a movement of this character among the consuming industries. The Exposition will aim, more so than ever in previous years, to attract the buyers of the allied industries in order to show them which new developments of the past year, both in products and equipment, will be available for their purposes. To the chemical people, to the chemical consumers, - the leather, rubber, paper, glass, metal, textile, medicinal, and a hundred other industries, an appeal will be sent to come to the Exposition, and to take stock of their needs in equipment and chemicals before they come.

"The Market Place of the Chemical Industries" summarizes the chief object of the Eighth National Exposion of Chemical Industries, a meeting of chemical people where "buy" and "sell" will play the leading roles. To do everything possible toward an expansion of business in the chemical and allied industries, will stand at the head of the list among the purposes of the 1922 Exposition. The management of the Exposition is going out with the admitted purpose of attracting all the buyers of chemicals and equipment to show them who are offering the products best suited for their needs, and to give the sellers an opportunity of demonstrating why the buyers should buy, what they should buy, and where they can buy to best advantage.

Although the Chemical Exposition in past years has always been a factor in bringing buyers and sellers together, a broad educational campaign in regard to American things chemical has also played a prominent part. This year, however, although the appeal to the technical men of the industry will be as great as ever, encouragement of buying as a step in stimulating the chemical business generally, will hold the center of the stage.

PRODUCTION AND CONSUMPTION OF NEWSPRINT IN UNITED STATES 1913-1921

The consumption of newsprint in the United States for the first four months of 1922 has shown a great increase over the figures for past years, being 7 per cent greater than for the corresponding period of 1920 which was the "peak" year up till that time.

In view of this fact it will be of interest to study the growth in the consumption of newsprint for a series of years past. Unfortunately, the Federal Commission did not publish statistics previous to 1918 so that we are not able to reckon with the differences in the stocks held at the mills or with those held by the publishers. We shall, therefore, have to look at the quantity of newsprint available for consumption rather than the actual consumption. These figures will, however, serve as a fairly accurate basis of comparison and in a later in a later paragraph we can examine the more accurate figures from 1918 onwards.

The quantity of newsprint available for consumption depends upon three factors: (1) Production; (2) Imports; (3) Exports. These three factors for the years 1913 to 1921 are as follows:

	Producton Tons	Imports Tons	Exports Tons
1913	1,305,000	219,602	43,276
1914	1,283,000	315,475	61,239
1915	1,239,000	368,409	55,056
1916	1,315,000	468,230	76,443
1917	1,359,012	559,113	97,544
1918	1,260,285	596,270	96,446
1919	1,374,517	627,559	110,624
1920	1,511,968	729,866	46,225
1921	1,226,189	791,978	16,850

By adding the imports to the production and subtracting the exports we arrive at the quantity available for consumption:

	Available for Consumption	Increase per cent. over previous year	Increase per cent. Over 1913
1913	1,481,326		
1914	1,537,236	3.8	3.8
1915	1,552,353	1.0	4.8
1916	1,706,787	9.9	15.2
1917	1,820,581	6.6	22.9
1918	1,760,109	3.3 x	18.8
1919	1,891,452	7.4	27.7
1920	2,195,239	16.0	48.2
1921	2,001,317	8.9 x	35.1
	Available	per cent.	per cent.

x Decrease

One of the most remarkable facts shown in the above tables is the small variation in the production of newsprint in the United States, a sharp contrast to the steady increase in production in Canada. Production of the U. S. mills in 1921 was less than in any previous year listed and even in 1920, the highest figure was only 16 per cent greater than in 1913. In the same period Canadian production increased from 350,000 tons to over 800,000 tons; in 1920 it was 883,000 tons or slightly over two and one-half times the 1913 prodpuction.

To offset this lack of growth in production, the imports of newsprint into the United States have shown a steady increase in this period. Imports in 1921 were 265 per cent greater than in 1913, an average increase of 33 per cent annually. Since 1913 the United States has depended upon foreign newsprint to the extent shown in the following table:

Year	Imports as per cent. of Consumption	Year	Imports as per cent. of Consumption
1913	14.9	1918	33.3
1914	20.5	1919	33.1
1915	23.7	1920	33.2
1916	27.4	1921	39.5
1917	30.7	1922(1st 4 mos)	42.2

As mentioned previously the above figures refer to the amount of newsprint **available for consumption** and take no consideration of fluctuations in stocks during the year. From the beginning of 1918 we are able to give more accurate consumption figure taking actual shipments from the mill, imports exports and increase or decrease of stocks in the hands of those publishers reporting to the Federal Trade Commission.

This method of working the consumption gives us the following results for 1918 to 1921 inclusive:

	Tons	per cent of previous year	per cent of 1918
1918	1,711,858		
1919	1,964,973	114.8	114.8
1920	2,112,285	107.5	123.4
1921	2,024,569	95.8	118.2

It will be seen that these figures are somewhat different from those given previously, e. g. 1920 according to this method of figuring shows an increase in consumption on over 1919 of 7.5 per cent, whereas the increase in the amount of paper "available for consumption" was 16 per cent. Again the consumption in 1921 was only 4.2 per cent less than in 1920, whereas the amount "available for consumption" was 8.9 per cent less than in the previous year.

These apparent contradictions are accounted for by the variations in the quantities of newsprint held in stock by the publishers. During 1919 these stocks decreased by 69,482 tons, in 1920 they increased by 83,930 tons.

Most of the increase in stocks in 1920 took place after the end of March and this goes to show once more that the scramble for paper was due rather to hoarding by publishers than to an actual scarcity of the supply. In 1921 producton fell off considerably but publishers' stocks decreased by 22,423 tons, imports increased by 62 tons and exports declined by 29,000 tons, all of which helped to offset the lack of production. When these figures are taken into consideration, the variatons in consumption of newsprint during the last few years were not so great as the production figures indicated. but were considerably influenced by the stocks carried by the publishers. Publishers built up large stocks towards the end of 1920 and up till the end of April 1921. Since that time they have been drawing on those stocks and at the end of April 1922 stocks reported were the lowest since July 1920.

At a meeting of stockholders of the Peshtigo Pulp and Paper Company, and the Peshtigo Fiber Company held at Appleton, Wis., May 2nd, a new corporation, to be known as the Peshtigo Paper Company, was formed to take over the business and the assets of both organizations. John G. Sutherland, of Dayton, Ohio, vice-president of the Escanaba Paper Company, will be manager of the new concern. Its capitalization is $2,000,000.

A Dictionary of Pulp and Paper Mill Terms

(Continued from last issue.)

Imitation Parchment
(1) Paper rendered grease and water proof to some extent by prolonged beating.
(2) Paper subjected for a short time to the action of sulphuric acid, which must be quickly and entirely washed out before drying. This treatment toughens the paper considerably.

Imperial. See **Sizes of Paper.**

Impression Papers. See **Duplicating Papers.**

Indanthrene Blue. A blue dye of exceptional fastness to light.

Index Boards. Pulp boards made of strong stock, even, hard sized, well calendered, giving a good writing surface.

Indian Red. A form of finely divided, red ochre, used in coloring wrappers and boards.

India Proof Paper. Thin paper made from the inner fibers of the bamboo stem. Extremely soft and absorbent, it is, therefore, eminently suitable for taking full-bodied impresssions in plate printing.

Indicator
(1) An instrument that may be attached to the cylinder of an engine or any reciprocating machine, having a card upon which a diagram is inscribed indicating abnormalities in any part of the stroke.
(2) In chemical tests, a substance indicating the end of a reaction.

Induction Motor. The usual form of electric motor in which a rotating armature induces alternate positive and negative currents by cutting the magnetic lines of force.

Ingrain. A name applied to mottled papers.

Insides
(1) Sheets in packages, exclusive of four or five outside sheets.
(2) In newspapers, the ready printed section furnished to country papers (patent insides).

Insulation. The separation of conducting materials by non-conducting materials. Dead (not moving) air is a very good insulator, hence many insulators are based on maintaining air space without circulation.

Insulating Paper. See **Cable.**

Interlocking Drive. An arrangement recently applied whereby motors driving the sections of a paper machine are synchronized for maintaining uniform speed.

Ion. That part of a salt or other electrolyte which carries the electrical charge. Na and No_3 are the ions of nitrate of soda.

Iodine. An element of the halogen group. Atomic weight 126.92. A solution, decinormal strength, is used to determine sulphurous acid in sulphite pulp mills.

Iridescent. Paper exposed to fumes of ammonia, having been first soaked in a mixture of gum, sulphate of iron, sulphate of indigo, and nutgalls, in solution.

Iron Oxides. See **Ferric** and **Ferrous Oxides.**

Iron Sulphate. See **Ferrous sulphate.**

Isinglass. A high grade of gelatine obtained from the swimming bladders of sturgeon. Mica is sometimes incorrectly called isinglass.

Ivory. Special finish on high grade cards, obtained by calendering through rolls upon which beeswax has been rubbed.

Ivory Boards. Hard, white, transparent boards, made from well beaten stuff, the substance being obtained by bringing two or more webs of moist paper together, the junction being effected by pressure, no adhesive being employed.

J

Jack. A name applied to several mechanical contrivances, certain levers, a spring clip terminal in telegraph or telephone instruments, whereby instruments can be quickly brought into circuit. Screw jacks and hydraulic jacks are operated to raise heavy objects.

Jack Ladder. The haulway up which logs are taken from water storage into sawmills, or to be loaded.

Jacket. The felt wrapped round a roll, as in the case of couch rolls. More correctly, a tube of felt of the proper size to be drawn over the top couch roll of a paper machine or the couch rolls generally.

Jacketed. Covered with a jacket. In the case of certain cooking or heating apparatus, provided with double wall for steam, hot water, or oil space to prevent direct contact with source of heat. Kettles for treating rosin with soda to make size are frequently jacketed.

Jacquards. Thick papers of ordinary quality made from jute and waste papers, cut and perforated to suit the Jacquard looms in spinning factories.

Japanese Copying. Specially thin and strong papers made in Japan from long fibers used for copying books.

Japanese Paper. This is made from the bark of the plant, **Morus Papifera Sativa,** and is used for fine engravings and especially for proofs of engravings and etchings.

Japanese Vellum. Thick papers made of Japanese fibers, very tough and durable, almost as difficult to tear as vellum. Finished with a good surface, suitable for certificates, and for various uses where very tough and durable material is required.

Javelle Water. A bleaching fluid prepared by adding potassium carbonate to ordinary chloride of lime liquor. The clear liquor is convenient for bleaching smail quantitles of fibers experimentally, as there is no deposit of lime on the fibers, which sometimes occurs in the case of ordinary chloride of lime.

Jordan. See **Refining Engine.**

Joule's Equivalent. The mechanical equivalent of heat. The heat required to raise one pound of water one degree Fahrenheit, if translated into energy without loss, would raise 778 pounds one foot vertically.

Journal. That part of a shaft actually in contact with the bearing.

Jute. The bast fibers of the plants **Corchorus capsularis** and **Corchorus olitarius** (Order, **tiliacae)** are the source of jute or "gunny" used for sacks, cordage, etc., hence finding its way into paper.

K

Kainite. Native potash alum—potassium aluminum sulphate.

Kaolin. See **China Clay.**

Kathode. The conductor or electrode by which a current leaves a conducting system.

Kerf. The cut made by a saw.

Kerosene. Coal oil, astral oil, sometimes called paraffine oil.

Killed Acid. Called, also, killed spirits Hydrochloric acid, neutralized by the addition of zinc until effervescence ceases. Used as a flux in soldering.

Knife-Barker. See **Barker.**

Knotter. A screen for removing knots, uncooked chips, or other foreign matter from cooked pulp. usually a revolving cylinder through the screen on the sides of which the fine pulp runs, while the tailings are discharged at the end.

Kollergang. See **Edge Runner.**

Kraft. The word itself means "strong." Originally used of paper made from incompletely cooked spruce soda pulp worked into half stuff by a kollergang or edge runner; now usually refers to paper made from sulphate pulp, or otherwise. "Kraft pulp."

Kraft Brown. Brown papers made of spruce soda pulp of high quality, and designated by the German word **kraft** meaning **strength.** Usually refers to paper made from sulphate pulp.

L

Labarraque Solution. Solution of sodium hypochlorite.

Laboratory. A place in which tests are made and experimental work is carried out.

Lag. Lagging
(1) The process of covering boilers, etc., with non-conducting material.
(2) The enlarging of a pulley by applying layers of wood, leather, etc., to its face.

Laid. Paper made by the use of a dandy woven in such a way as to leave distinct lines; those made in one direction being close together, others at right angles being about one inch apart. See **Wove** and **Dandy.**

Lake. An insoluble color fixed on fiber by formation of a color precipitate. The word is used in several somewhat similar cases.

Lamp Black. A black material obtained by the incomplete combustion of hydrocarbons.

Lanolin. A semi-solid fat obtained from wool scouring, which readily forms emulsions with water.

Lap. A sheet of pulp as taken off the wet machine, and folded for convenience in handling. It is often subsequently subjected to hydraulic pressure.

Lapis Lauzuli. The natural ultramarine, which see.

Lapping. A term used in England for certain wrappings. The production of pulp in laps.

Larch. See **Tamarack.**

Leach. To wash out, or to subject to a washing process.

Lead Acetate. When added to pulp in the beating engine, followed by a solution of potassium bichromate, a bright yellow precipitate, chrome yellow or canary yellow, is produced, which colors the fibers. Used in testing paper for traces of sulphur and sulphur compounds, since filter paper saturated with lead acetate turns black or brown in contact with hydrogen sulphide.

Lead Chromate. A color produced by precipitating lead acetate with potassium chromate in the presence of the fibers. Called canary yellow or chrome yellow.

Leather Boards. Imitation leather prepared by pulping up leather scrap with or without jute or manilla paper stocks or wood pulps. Used for boxes, trunks, shoe counters and heel fillers.

Leatherette. Papers used for box covering and for covers of cheap notebooks; common papers made the color of the leather of which they are imitations, either as colored body papers or with colored surface, and embossed with leather grain.

Ledger. Heavy account-book papers, usually colored faint blue, tub-sized, often laid and pressed.

Lignifiec Fiber. Mechanical pulp; also, jute or any unbleached chemical wood pulp.

Lignin. A non-fibrous, undefined substance associated with celluloses in wood, completely removed by adequate chemical treatment.

Lignite. A form of fossil vegetable material, almost converted into coal, but not hard or black like the true coal.

Lignocellulose. The compound cellulose found in wood, as compared with the simpler cellulose which is found in the seed hairs of cotton.

Lime. See **Caustic Lime.**

Linen. Paper made from linen rags. Often incorrectly applied to rag papers generally.

Linen Brief. Foolscap paper ruled with thirty-six lines across the width of the paper and a vertical marginal line.

Linen-Faced Papers. These receive their patterns in one of three ways: (1) By passing between embossed and engraved rollers, as described under embossed papers. (2) By interleaving with zinc plates upon which are glued sheets of linen, and passing through the plate-rolling machine. (3) Sheets of linen used between sheets of paper to be impressed — metal plates top and bottom, and pressure applied at the plate rolling machine.

Liners. Kraft papers from pulp made by sulphate process from mill edgings and slabs, largely from Southern Pine.

Litharge. Yellow oxide of lead, PbO; used with glycerine in cements for sulphite digester linings.

Litho, Lithographic. A soft-sized paper, carefully made and dried, so that when moistened during the various printing operations, the expansion or stretch is very slight. Used for illustrations and color printing. When made for large poster work, care must be taken to maintain uniform thickness of sheet throughout, as the printing is done by contact with the face of a stone or aluminum plate upon which the design is raised only to a very minute degree above the level; hence the paper must be level to get the fine inking effects.

Lithopone. A white pigment prepared from the precipitate produced in the reaction between zinc sulphate and barium sulphide; also called Orr's white, Griffith's white, or ponolith.

Liquor. The solution used or extract produced in various processes; bleach liquors, green liquor, white liquor, waste sulphite lye, black liquor, etc.

Litmus. A vegetable dye which is red in acid media and blue in alkaline. Often used as an indicator for presence of acids or alkalies.

Litmus Paper. A chemical test paper made by soaking filter paper in tincture of litmus. Acids turn the paper red; alkalies turn the paper blue.

Loans. Strong tub-sized, light rag papers, sometimes hand-made. Long treatment in the beater characterizes papers of this type; several sizes, from medium, 21″ x 17″, to imperial, 29½″ x 21½″. A little heavier than bank papers, not highly glazed.

Loft Dried. Paper hung up in sheds or lofts to dry slowly, so as to prevent any loss of strength due to drying rapidly on the steam-heated dryers of the machine.

Log-Haul. See **Jack Ladder.**

Logwood. The wood of **Haematoxylin Campeachianum,** used as a source of black and gray colorings in certain papers.

London Boards. Originally, boards formed by pasting sheets of best hand-made drawing paper. Thick pasteboards are sometimes supplied as London board.

Long Elephants. These are used by the paper stainers: that is, wall-paper printers.

Luminous. Paper prepared by mixing a phosphorescent compound with the half stuff.

Lunar Caustic. See **Silver Nitrate.**

Lye. A name usually applied to a strong solution of caustic soda or potash, but often used for other liquids; sometimes also for solid caustic soda.

M

M Paper. That which is not up to the first sorting, but in which the imperfections are trivial, perceptible only to the expert.

Machine. When the "machine" is referred to in a paper-mill, it is always understood to mean the paper-making machine.

Machine Finish
(1) The appearance of a sheet of paper after coming off the last dryer of the machine; not calendered.
(2) Paper calendered directly at the end of the machine is also called "machine finished."

Machine Tender. The senior member of the crew in charge of a paper machine. In operation, while having general supervision, his particular care is usually the wet end, and his station covers the portion from the screens to the dryers.

Madder. A root (**Rubia Tinotorum**) producing several colors, such as chocolate, Turkey red, purple or pink, according to treatment.

Magazine Grinder. A machine for making mechanical pulp, in large pulp mills, equipped with a rectangular bin placed vertically over the grindstone, and fitted to contain pulpwood blocks; auxiliary equipment is arranged to supply them automatically to the stone as required.

Magazine Paper. Soft printing paper with a good machine finished or super-calendered surface, in order to give equal printing surfaces for half-tone illustrations both sides of the sheet. Imitation art papers are also used for illustrated magazines. Usually composed of bleached sulphite and soda pulp, also fillers.

Magenta. See **Fuchsine.**

Magnesia. Oxide of magnesium, MgO; present in quicklimes. Prepared from dolomite or limestones containing carbonate of magnesium. Sometimes used by sulphite mills with milk of lime systems to increase the magnesia in the liquor.

Magnesium. An element, symbol Mg, atomic weight 24.32. One of the alkaline earth metals, similar to calcium in chemical properties and often associated with it in limestones and dolomites.

Magnesium Silicate. See **Agalite, Talc, Asbestos.**

Malachite Green
(1) A mineral, basic copper carbonate.
(2) A coal-tar dye matching the mineral pigment in color.

Manifold. Paper for use in copying or multigraph work. Sometimes slightly waxed.

Manila. A paper made originally from bast fibers of manila hemp, **musa textilis;** now frequently refers to strong grades of paper made of chemical wood pulp: used for tags, wrapping and filing folders. The term is used to indicate the color and finish as well as the strength.

Map Paper. Thin and tough, folding without cracking, usually slightly sized with animal sizing.

Marble. Paper used by bookbinders, the color design of which is prepared by laying paper on the surface of a bath of gum tragacanth, over which dyes have been sprinkled. The workman combs the surface into a variety of patterns.

Marcasite. White iron pyrites: a mineral sulphide of iron, FeS_2.

Marshall Drive. The usual form of drive for paper machines, with core gear and pinion. The driven section operates at right angles to the driving shaft, each section being controlled by cone pulleys on main line and counters, speeds being adjusted by charging positions of belts.

Marshall Refiner. A refining engine from its designer, developed in Great Britain; similar to the Jordan, but has in addition a disc attached to the large end of the cone provided with bars, which revolves against another stationary disc. The stock after passing the cone must pass between these discs.

Marshall's Paper Tester. An instrument for measuring the tensile strengh of paper by breaking a strip of standard width. Incidentally, the stretch is measured.

Mauve. The first of the aniline dyes prepared in England by W. H. Perkin in 1856; dyes various shades of purple.

Mechanical, Mechanical Pulp. Pulp prepared by grinding wood by holding it with hydraulic pressure against a revolving grindstone with the addition of water.

Medium. See **Sizes of Paper.**

Megasse. See **Bagasse.**

Mercaptan. A very evil smelling compound, methyl mercaptan, $(CH_3 SH)$, found in the gases from sulphate pulp cooking.

Mercerize. To treat textiles made of cotton cellulose with strong solutions of caustic soda under conditions suggested by Mercer, producing a silky sheen.

Mercerized Cellulose. Cellulose treated with strong solutions of caustic soda for the manufacture of viscose; alkali cellulose.

Mesh. The size of opening in a wire cloth. The fourdrinier machine wires are usually 60 to 70 meshes to the linear inch; but for special cases, such as cigarette and similar papers, as small an opening as 90 to the inch might be used.

Metallic. Specially coated paper on which marks may be made with metal points: silver, aluminum, etc., used for note-books and indicator diagrams. Mixture of whiting, lime and zinc white is used and subsequently glazed.

Methyl Alcohol. Columbian or wood spirit, (CH_3OH). Now legally called Methanol in the United States, and Methylhydrate in Canada. Obtained by destructive distillation of wood.

Methylated Spirits. Not wood spirit, but grain alcohol (Ethyl Alcohol $C_2 H_5 OH$), which has been denatured by the addition of small amounts of wood alcohol or other substances.

Methyl Orange. A coloring matter, useful as an indicator in chemical analysis. When a drop of its aqueous solution is added to an alkaline solution a yellow color results. If a drop be added to an acid solution, a pink color results.

M. G. Caps. Machine glazed caps. Paper for wrapping purposes made on a Yankee machine, thus glazed one side only. Sometimes any strong thin wrapping paper used for bags.

Micrometer. A gauge used for measuring the thickness of paper sheets in thousandths of in inch or in millimeters.

Middles. A rough coarse board, used as a filler for finer pasted sheets. Generally prepared from waste paper and mechanical pulp.

Midfeather, Midris, Midriff. The partition down the center of a Hollander type beater or washer which determines the circulation.

Mildew. See **Mould.**

Milk of Lime. The white liquid produced by the agitation of slaked lime in water: the lime (calcium hydroxide), being slightly soluble, is largely held in suspension.

Mill Board. Cardboard made of wood pulp, waste paper or any kind of fiber waste. Best quality for binding is made from old rope.

Millon's Reagent. A solution prepared by heating mercury with its own weight of nitric acid (63 per cent. HNO_3), first cold and then gently warming till solution occurs. Add twice its volume of water, and let stand until sediment subsides. The clear liquid is M's reagent. It gives a white precipitate with protein, which becomes red on boiling. This reagent gives a red color on papers sized with gelatine or casein.

Mineral Blue. Ferric ferrocyanide.

Mineral Green. Carbonate of copper.

Mineral Oil. See **Petroleum.**

Mitscherlich Pulp. A sulphite pulp prepared by long cooking at low temperature and pressure. Named after Doctor Mitscherlich, who first used the method.

Minium. See **Red Lead.**

Moisture. Water absorbed or adhering to substances, as distinguished from water as a chemical constituent, or as any major part of a mixture. Water holding substances in suspension is not "moisture."

Moisture Test. The determination of moisture in pulp or paper as shipped. It is assumed as a trade condition that pulp in contact with the air will not dry beyond a stage when it contains 8 to 10 per cent. of moisture. Ten per cent. is the arbitrarily agreed limit for pulp: hence pulp is sold on a basis of 10 per cent. moisture: that is, each 100 pounds of pulp contains 90 pounds of absolutely dry (bone dry) fiber and 10 pounds of water. If a sample of shipped pulp contained 20 per cent. moisture and 80 per cent. bone-dry pulp, its air dry content would be calculated by dividing by 9 and multiplying by 10. $80/9 \times 10$ = 88.88 per cent. It would obviously not be correct to add one-tenth of itself to 80, which would give only 88 per cent. because the bone dry weight is 9/10 of the whole air dry weight.

Monel Metal. An alloy of copper, (23 per cent.) and nickel (67 per cent.), obtained by smelting the native nickel copper ores of Northern Ontario. Named for Ambrose Monel; used as a substitute for nickel and bronze, as acid-resisting fittings.

Monocotyledon. A plant which produces one seed leaf in sprouting Bamboo esparto and corn are monocotyledonous plants.

Mordant. An agent used to fix dyes on fibers. Alum acts as a mordant.

Mother-of-Pearl. An effect on paper obtained by immersing glazed paper in a bath of silver or lead salts, drying, exposing to vapor of hydrogen sulphide, and fixing the iridescent effects with collodion.

Mottled. Paper having a variegated effect, due to the introduction of a small amount of strongly colored fibers to stock of another color.

Mould. A fungous growth due to infection with spores of certain low species of plant life.

Mould. See **Cylinder Mould.**

Mould Made. Imitation hand-made paper, sometimes made on a cylinder mould by dividing the surface with rubber bands to simulate the deckle edges of hand-made paper.

Moulded. See **Mould Made.**

Mundic. Iron Pyrites. See **Pyrites.**

Muriatic Acid. A common name for hydrochloric acid.

Musa Textilis. See **Manila.**

Music Paper. Bulky paper made of esparto, straw or poplar pulp with a little sulphite. Cheaper kinds contain ground mechanical pulp. These are slack sized and machine finished, very little calendering.

Mullen Test. The energy in pounds per square inch required to burst a sheet of paper confined on the Mullen machine.

N

N Paper. Is inferior to the M grade; specks and wrinkles are common.

Naphtha. A term used for several volatile inflammable liquids. Naphtha proper is obtained from coal tar. Light petroleum liquids like gasolene are often called naphthas.

Naphthalene. An insecticide and moth repellent obtained from coal tar: sometimes added to motor spirits to speed up explosion in the cylinder. Is an intermediate in some important dyestuffs. Sold in balls, flakes and tablets.

Naples Yellow. A pigment, antimonate of lead.

Natron. A European name for sodium carbonate; soda ash.

Nature Browns. Brown wrappings whose color is due to the stock used and not to dyes. Such papers are made from sulphate and soda pulps, jute or mechanical pulp.

Needle. See **Cutlery.**

Nessler's Reagent. A solution of mercuric iodide in potassium iodide, used for detecting minute amounts of ammonia.

Neutral. Neither acid nor alkaline.

Neutral Alum. Alum to whose solution soda ash or caustic soda has been added. The aluminum hydrate is precipitated more readily from such an alum when used as a mordant.

News. Printing paper made largely from mechanical pulp. Newsprint containing from 10 to 25 p.c. sulphite. Recent indications are that news may be made entirely of mechanical pulp with proper modifications in grinding. News paper is soft sized and machine finished.

New Zealand Flax. A fiber used in ropes, obtained from the leaves of the plant Phormium tenax.

Nigrosine. A group of bluish black coal tar dyes, some of which are soluble in water; others in alcohol or oil.

Nip. The extent of passage of paper through a calender. One nip is when the sheet is passed between two rolls only.

Niter Cake. An acid sulphate of sodium, a by-product of nitric acid manufacture. Can be used with special precautions instead of salt-cake for sulphate pulp manufacture. Accidents have occurred, due to the liberation of carbon dioxide from carbonates in the black ash or lime, causing suffocation of workmen.

Nitrate of Iron. A reddish iron salt for producing cream to buff shades in paper.

Nitric Acid. Aqua fortis, acid azotic, HNO_3. Usual strength of concentrated, specific gravity 1.42, 70 p.c. HNO_3. Corrosive poison; antidotes, weak alkaline solutions, such as baking soda.

Nitro-Cellulose. Gun cotton; produced by treating pure cotton with nitric acid in the presence of sulphuric acid. It can be prepared from wood cellulose, but the product is not, for various reasons, as stable as that from cotton.

Nitro Muriatic Acid. Aqua Regia, a mixture of nitric acid, (18 parts) and hydrochloric acid, (82 parts).

Non-Curling Gummed Paper. Specially prepared gummed paper, the body paper being made as nearly free from stretch as possible; the coating of gum when dry is broken into fine particles by drawing the finished paper over a steel bar. This prevents the film of gum from acting as a single continuous surface.

Normal Solutions. Solution used in analytical chemistry, their strength being based on the hydrogen equivalent of their molecular weight per litre.

O

Oakum. Hemp fiber teased out from old rope impregnated with tar or pitch and used for caulking the seams of ships, etc.

Oatmeal Paper. A paper for wall-paper hanging purposes prepared by incorporating fine sawdust with paper made largely from mechanical pulp with a little sulphite. The sawdust is applied when the sheet is being formed. Frequently ,the sawdust is dyed a different color from that of the paper.

Occlusion. The property of some metals whereby relatively very large volumes of gases can be absorbed by them. Hydrogen is occluded by palladium wire to the extent of 975 times its own volume at red heat, and 376 times at ordinary temperatures. Hydrogen in this condition very readily enters into chemical reactions, acting as a reducing agent.

Ochre. A name given to several natural hydrated oxides of iron, mixed with clay, of shades from cream to dark brown or red. The number of shades is much increased by roasting the oxides at different temperatures and with different conditions—reds and purples with oxidizing conditions and olives and greens with reducing conditions. Burnt umber and sienna belong to this class.

Ochre Glazed. Wrappers of various qualities, colored with ochres and glazed.

Offset. A special paper used for taking lithographers' proofs; must be hard-sized, well beaten, and have, as nearly as possible, the same surface on both sides. Good sulphite stock with some ledger clippings can be used. Surface must be free from loose or upstanding fibers.

Ohm. The unit of electric resistance.

Oil of Vitriol. See **Sulphuric Acid.**

Oiled. Paper used in letter copying books. Prepared by soaking paper in boiled linseed oil or a mixture of oil and turpentine. Sometimes the oil is just brushed over the paper. Should be of strong, long stock. Oiled paper largely used in the packing industry is prepared by saturating heavy manila paper with a neutral mineral oil.

Onion-Skin. A light, strong paper, glazed on one or both sides, made from well-beaten rags and sulphite, used for manifold or carbon copies.

Opacity. The property of being opaque.

Opaque. Preventing the passage of light. Short fibers and quick beating tend to opacity in paper, as well as the presence of mineral fillers or old papers.

Orange Mineral. A pigment prepared by roasting lead carbonate.

Orr's White. See **Lithopone.**

Osmosis. When two liquids are separated by a porous partition the tendency to penetrate the partition is known as Osmosis. In some cases the penetration will proceed in both directions. Osmosis is the principle whereby sap rises in trees by penetration of the cell-walls. Osmosis is a factor in the cooking of wood-pulp.

Out Board ,Out Bored. Bearings placed outside a pulley, which has to be hung on the otherwise unsupported end of a shaft.

Out of Register. In colored printing or lithographic work, if two or more colors do not fit exactly in their places on the paper, they are said to be out of register. This may be caused by expansion or contraction of paper between printings.

(To be continued.)

Summer Meeting a Great Success

Last January Mr. Edward Beck, the new secretary of the Canadian Pulp and Paper Association gave proof of his ability as an organiser in the success of the annual convention of the Canadian Pulp and Paper Association. He has just added another bit of laurel in the accomplishment of the eighth annual summer trip of the Technical Section. There was not a single hitch in the arrangements and everyone was given every convenience and comfort that could be desired.

Twenty members left Montreal in a special sleeper attached to the Continental Limited over the Canadian National Railway lines last Monday night and were joined at North Bay by a delegation from Toronto and the Niagara district mills and by a delegation from the Spanish River Company's three plants and guests from Chicago. From North Bay the special technical section car was a scene of happy reunions and a jolly good time. While everyone was in the best of spirits there was a good deal of serious consultation and discussion of matters connected with the objects of the Technical Section. The efficient service on the train was appreciated.

That Happy Feeling After a Good Meal

Messrs. Hovey and Buncke of the Abitibi staff met the party at North Bay and escorted the thirty-four guests of the mill to Iroquois Falls where three other guests had already arrived from Kapuskasing where the Spruce Falls Pulp and Paper Company is proceeding with the installation of equipment. The end of the journey was reached about seven o'clock and as the party had been well provided with dinner on the train, there was a good long evening for a preliminary trip of inspection through the mill. This proved to be a very happy arrangement on the part of the committee as it gave the visitors a fine chance to understand the general layout of the plant and town as well as to determine upon the particular department which they would desire to inspect more particularly the next day. Some of the party availed themselves of the accommodations at the hotel but beds were not in order, at least not occupied, until some time on Wednesday morning. The special car was parked at the station.

The weather on Wednesday and Thursday could not possibly have been improved upon the everybody enjoyed the facilities for studying the layout and operation of one of the finest complete newsprint plants in the world. Every department had visitors who were particularly interested in special features and the guides and the men on the job proved themselves able mentors and gave very helpful discussions on their work. The management had provided sufficient guides so that the parties were small, which was a very good arrangement.

On Wednesday noon a complimentary luncheon was tendered the guests by the Abitibi Power and Paper Co. at the hotel and it was thoroughly enjoyed by everyone present. Mr. Carruthers, known to the party as Jovial George, acted as toastmaster and it need scarcely be said he performed the ceremony to the satisfaction and delight of the diners. His Worship Mayor Vanier was the first speaker and he welcomed the party to the fairy town of the north. He did not, however, explain why it was that the steel plant from the Soo was not erected and in operation. Mr. R. A. McInnis, manager of the company, spoke with just pride of the progress that had been made since the first boat load of engineers and supplies came down the river to the mill site. He touched on the work of the technical section with good effect in his reference to the need of the technical man to be "problem conscious," that is, that he be aware of the puzzles and difficulties met with in the manufacture of pulp and paper that he be guided and organize his work with the object of solving the pressing problems of operation and control. The technical man is comparatively new in the industry. When he gets settled and organized there is no doubt but that much will be accomplished.

Mr. O. F. Bryant, chairman of the Technical Section, responded to the hearty welcome of the Mayor and the Manager Mr. W. G. MacNaughton, secretary of the Technical Association of the Pulp and Paper Industry, who had come all the way from New York, expressed the appreciation of his Association at the pleasure of visiting the mill and meeting some old friends whom he had met while he was engaged in construction work when the Spruce Falls mill was begun. His advice to the technical men was "Prove all things: hold fast to that which is good". Mr. MacNaughton mentioned the committee on the study of Wastes and on the need for a committee to study the efficiency of equipment offered for sale.

The Big Chief in Ceremonial Dress

J. N. Stephenson, editor of the Pulp and Paper Magazine and the Text Books, mentioned the progress that was being made with Volumes 4 and 5 and announced that with the cooperation of the Pulp and Paper Association, correspondence work based on the text books was already in working order with students enrolled. Mr. Edward Beck, secretary of the Technical Section, got off a good one on Mr. Carruthers which everybody appreciated. He gave some encouragement to Mayor Vanier who had asked if the Technical Section considered the problem of how the drys could be beaten, by saying "Come to Quebec and we'll show you".

One of the serious questions that came up for consideration, being introduced by a member of the Spanish River delegation, was to find out if "Red Raven Splits."

By happy coincidence there was a baseball game in the Northern Ontario League series, between Iroquois Falls and Timmins on Wednesday evening and the whole town, together with the Technical men, enjoyed an interesting game which was won by the home team. After that the delegates were entertained at dinner in the homes of the Iroquois Falls people. This was one of the very delightful arrangements that the committee had made and an opportunity which was appreciated by all.

On Wednesday evening, an entertainment was given in the Community Hall which consisted of a minstrel show, music and recitations. The feature of the evening was the initiation of O. F. Bryant as the Great Big Chief of the Wazalukunixpopacatizels. The ceremony was unique to say the least and was witnessed with great interest and close attention. Refreshments and smokes were passed about and everybody had a fine time.

On Thursday morning the official picture was taken and a meeting was held in the company's class room where slides were thrown on the screen showing the progress that had been made, not only in production but in control of operations and uniformity of product. After an interesting discussion of points brought up in connection with the slides, there was more visiting of special features of the plant and the developments about the town, until train time. Several parties took occasion to visit the school house and found it to be one of the most modern and well equipped to be found anywhere. It is as nearly fire proof as could be made and is designed for the comfort and health of children as well as to provide the best possible opportunity for an education. Nowhere have we seen a brighter looking lot of children nor a more capable staff of teachers. The best part of it seemed to be that they were thoroughly imbued with the spirit of the North country and of its wonderful opportunities.

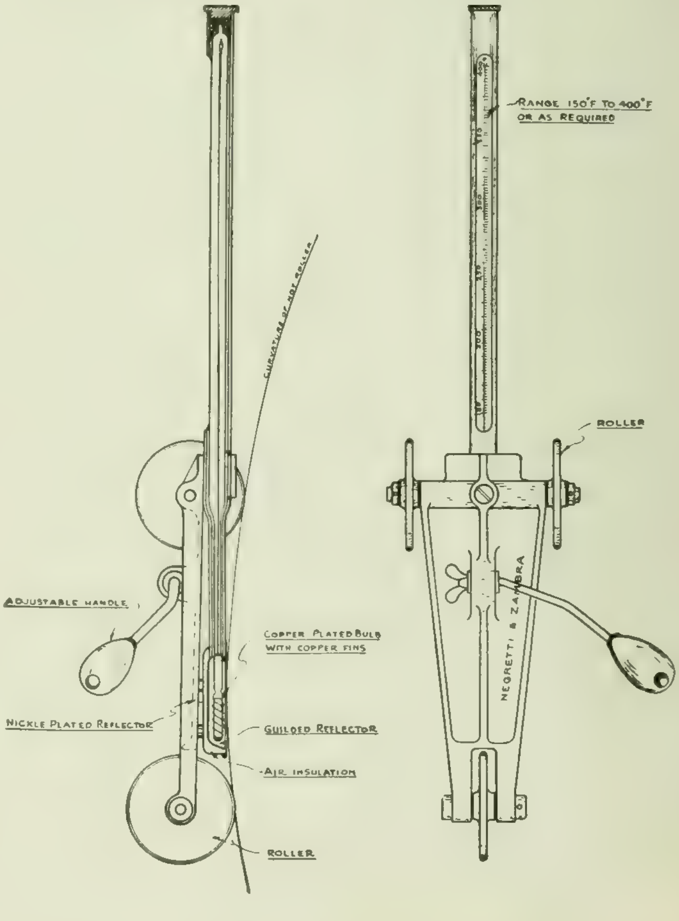
The return journey started Thursday noon without special incident but there was noticed a number of groups talking over the events of the visit and discussing matters of interest to pulp and paper men. The whole spirit of the trip was well summed up in a remark which we heard at the mill. One man from a long way off said to the Guide "You have just told me something good, I would like to tell you something that works well in our plant" and he went on to explain a little scheme that made for greater efficiency. Such conversations were typical of the visit and typical too of the helpful and happy relations that exist among all the technical men in the industry. It is this kind of thing which holds so much promise for progress in pulp and paper manufacture.

By executing some very snappy work, the editor of the Broke Hustler, Mr. Alex. Dewar, was on the platform at Porquis Junction with a permitted account of the convention. This was a nicely illustrated, 24 page souvenir, containing data on the Abitibi Power and Paper Co., the Technical Section, and notes on the various meetings.

TO MEASURE THE TEMPERATURE OF DRYERS

One of the items in the discussion of the drying of paper which attracted quite a bit of attention at the meeting of the Technical Association last April in New York, was the problem of measuring the temperature of paper machine dryers. The Pulp and Paper Magazine has just received from the Canadian office of Messrs. Negretti & Zambra of London (45 Bank Street, Ottawa) an illustration of a thermometer which was specially designed for a large paper mill in Scotland and which proved very satisfactory. So many calculations involved in the solution of the problem of drying paper depend on getting the correct temperature of the dryers, that an accurate instrument is of great importance.

The thermometer illustrated consists of an aluminum frame to which is fitted three rollers and which carries a glass mercury thermometer the bulb being of very small volume to reduce thermometric lag. In order that the bulb shall take up the temperature more readily it is copper plated and also provided with copper fins to make it more sensitive. Surrounding the bulb is a small air space, and immediately behind this is a giled reflector; this reflector is formed of a special shape so that it reflects the heat given off by the hot roller on to the bulb. Behind the gilded reflector is a further air space which forms an air insulation. The use of the nickel plated reflector which is polished on the outside prevents the radiation of heat from other objects affecting the temperature of the bulb. In order that the bulb shall not actually touch the hot roller and obtain heat by friction the three rollers to the frame are adjusted so that the bulb does not come in contact with the roller. The use of the adjustable handle which may be set at various angles is so that the thermometer may be held in position without the observer coming in contact with the surrounding machinery.



Technical Section

REVIEW OF RECENT LITERATURE

A.— Properties and Testing of Materials and Products

A-11 The Cornish China Clay Industry. W. TRETHEWEY. **Pulp and Paper,** xix 1093-1094, (Oct. 27, 1921). A brief outline of the prospects of the English China clay industry in the near future. -A. P. -C.

A-15 Comparative Action of Heat on Cellulose, Hydrocellulose, and Oxycellulose, and the Characterization of Hydrocellulose by Dry Heat. ED. JUSTIN-MUELLER. **Bull. Soc. Chim.,** (IV), xxix, 987-988, (1921); **Chem. Soc. Abs.,** cxxii, Pt. 1, 11, (Jan. 1922). Hydrocellulose caramelises at a lower temperature than oxycellulose and at a much lower temperature than cellulose. If the specimen under examination is submitted to dry heat, it will assume a brown color at 130-150 degrees, at which temperature oxy-cellulose shows at most only a pale yellow color and cellulose no change at all. -A. P. -C.

A-15 Conversion of Cellulose into a Biose Anhydride. KURT HESS. **Ber.,** liv (B), 2867-2885, (1921); **Chem. Soc. Abs.,** cxxii, Pt. 1, 12, (Jan. 1922). The author gives the result of an investigation into the action of acetyl chloride, acetyl bromide, benzoyl bromide, thionyl chloride, and propionyl bromide and absolute hydrogen haloids on cotton cellulose, wood cellulose, acetylcellulose. The investigation was undertaken to decide whether cellobiose is the fundamental unit in the structure of the cellulose molecule and dextrose is formed therefrom, or whether dextrose itself is also an essential factor in the formation of cellulose. -A. P. -C.

A-15 Preparation and Alkyl Interchange of Cellulose Esters: Celluose Stearate and Laurate. AD. GRUN and FRANZ WITTKA. **Z. angew. Chem.,** xxxiv, 645-648, (1921); **Chem. Soc. Abs.,** cxxii, Pt. 1, 114, (Feb. 1922). The attempt to find a simple method for the preparation of cellulose esters of the higher fatty acids has led to observations on the interchange of alkylgroups between cellulose esters and alcohols, and between alkyl esters and cellulose. Cellulose esters of the higher fatty acids are formed by acylation of cellulose with an acid chloride and pyridine. The properties of cellulose distearate and di-laurate are given. The stability of cellulose esters increases with their molecular weight. -A. P. -C.

A-15 Requirements of a Brief Critical Monograph on the Chemistry of Cellulose. LOUIS E. WISE. N. Y. State College of Forestry, Syracuse, N. Y. **Paper,** xxix, No. 15, 26-28, (Dec. 14, 1921). The article outlines the type of material and data that should be incorporated into a monograph on cellulose. Many of the older terms that still appear in the cellulose literature should be deleted or redefined. Proper weight should be given to carefully selected fundamental data and to the work of critical investigators. All hypotheses dealing with the constitution of cellulose or its derivatives should be subjected to close scrutiny, and those based on good experimental data should receive emphasis. Recent work on the colloidal properties of cellulose should be included. The monograph besides being critical should be suggestively written so as to stimulate research. A brief volume with a good bibliography appears to be more desirable than a series of monographs. -A. P. -C.

A-15 Acetolysis of Spruce Pulp. LOUIS E. WISE and WALTER RUSSELL. **J. Ind. Eng. Chem.,** xiv, 285-287, (April 1922). Acetolysis of Spruce sulphite pulp, when carried out as in the case of acetolysis of cotton, yields appreciable amounts of cellobiose octa-acetate. The yield of cellobiose appears to depend on the alpha-, or normal, cellulose content of the pulp, rather than on the so-called "total cellulose". The cellobiose reaction furnishes another link in the chain of evidence that the normal cellulose of spruce wood is chemically similar, if not identical, with that of cotton. -A. P. -C.

A-0 The Strength of Paper Making Fibers. RAYMOND FOURNIER. **Papier,** xxv, 17-19, (Jan. 1922). According to an article in **Kunstoffe,** cotton fiber has a mean tensile strength of 42 kg. per square mm. section, flax 72 kilos, and pine cellulose 30 kilos. H. Lecomte, by means of a very delicate apparatus devised by himself (not described) tested the strength of individual cotton fibers and values from 3.2g. for Tinnevelly to 10.5 g. for hard Peru. Taking an average of 6g. and an average diameter of 0.025 mm. the tensile strength is 12.245 kilos per square mm. Tests by Forbes on various textile fibers gave results varying from 2.6 kilos for **Sause veria** to 6.2 kilos for European hemp. These results are lower than those of Lecomte, probably because the former tested the individual fibers, while Forbes and other investigators worked on ropes or twines which had a certain amount of empty spaces; and also these ropes failed not only through the breaking of the fibers but due to the sliding of the fibers on one another. The strength of a sheet of paper or of pulp is much less than that of the fibers of which it is composed, as it is due to the ability of the fibers to resist sliding against one another. This is quite apparent on examining a torn sheet of paper, when it will be noted that the fibers have not been broken but merely pulled apart. -A. P. -C.

A-0 The Comparative Values of Different Specimens of Iodine for Use in Chemical Measurements. C. W. FOULK and S. MORRIS, Ohio State Univ., Columbus. Ohio. **J. Am. Chem. Soc.,** xliv, 221-229, (Feb. 1922). Some new forms of apparatus for the preparation and handling of pure iodine are described. The hygroscopic properties of iodine are discussed. A suggestion is made that solids like iodine that have a measurable vapor pressure at room temperature possess peculiar adsorptive properties due to the fact that a fresh surface is being continually exposed. -A. P. -C.

A-0 Paper Work of the Bureau of Standards. Paper Trade J., lxxiii, No. 25, 47-49, (Dec. 22, 1921); **Paper,** xxix, No. 20, 12-15, 20, (Jan. 18, 1922). Report of Director Stratton of the U. S. Bureau of Standards on the work of the Paper Section for the fiscal year ending June 30, 1921. The work covered finding a suitable method of detecting sulphate and sulphite fibers in paper, testing paper bags for lime and cement, testing the absorbent quality of blotting paper, method of testing the sizing and tearing strength of paper, compiling a circular on paper testing methods, manufacture of satisfactory paper for electrical condensers, finding the most suitable paper or cotton bags as substitutes for burlap sand bags, waterproofing paper

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PULP AND PAPER NEWS

C. Howard Smith, president of the Howard Smith Paper Mills, was elected first vice-president of the Canadian Manufacturers' Association last week. Mr. Smith read a very able paper on the railway situation.

One of the important resolutions adopted by the Canadian Manufacturers' Association urges taxation on imported publication, many of which are said to be practically advertising catalogs.

It is reported that Price Bros. & Co., are contemplating the commencement next year of the town and mill at Saguenay, plans for which were made some time ago.

Floods on the Chaudière River in the Beauce district carried away pulpwood booms and many cords were swept into the St. Lawrence and down toward the sea. About 1000 cords were sawaged by tugs. Most of the pulpwood belong to the Brown Corporation.

Mr. T. M. Hubley of the Federal Paper Company, Limited, secretary of the Montreal Paper Club, was entertained at dinner at the Queen's Hotel, Montreal, on the evening of June 1 by the staff of the Federal Paper Company, and of the Howard Smith Paper Mills, Limited. The dinner was described on the menu as "In memoriam to the batchelor days" of Mr. Hubley, who was married on June 28 to Miss Phyllis Rigdedale, of St. Lambert. Mr. Hubley—"a square boy who played the game"—received the congratulations of his hosts, who wished him the best of luck.

Recent floods are said to have carried away 10,000,000 feet of lumber of the Fraser Companies at Plaster Rock, N. B.

The use of beaver board in building was discussed at length by the Maritime Fire Chiefs' convention at Sussex, N.B., and was finally left with the Marshals of each province to take up with the fire marshall at Ottawa as to its use in buildings.

Mr. Henry J. Fuller has resigned as president of Canadian Fairbanks-Morse and is succeeded by Thomas McMillan, who has been with the Fairbanks-Morse organization for 16 years. He is a native of Toronto.

At the closing exercises of the Shawinigan Falls Technical Institute, the resignation of Principal Meddick was announced. Mr. Meddick had been connected with the school for ten years, but is now in poor health. The appreciation of the Board for his able services was expressed in the presentation to Mr. Meddick of a handsome gold watch.

William (Billy) Whyte and Earl Dunham are sole Canadian agents for Powitts & Spencer, Hamilton, Ont., makers of high grade felts for pulp and paper mills.

WAYAGAMACK PLANTS OPERATING FULL TIME

As a result of orders received for overseas markets, the plants of the Wayagamack Pulp and Paper Co., are now running at full capacity. The increase that has come recently has necessitated operating the plants the full 24 hours a day. The volume of business recently received has been the largest since the general set back in the paper industry set in.

Present enquiries would indicate that full capacity production will be the order for several months to come. In addition to the outside business, there has also been a noticeable improvement in the demand from the home market.

ABITIBI BUILDING HOUSES

The Abitibi Company will this year build 25 additional workmen's houses, of 6 and 7 rooms. This recalls the part which pulp and paper companies have taken in the town planning movement, which has been so freely discussed. The companies may take pride in the fact that they were pioneers in this movement, and that there is no industry which has done more in constructing model workmen's dwellings.

There is sound business sense behind this policy. While providing excellent housing accommodation for their people at moderate rents, the companies are ensuring a permanent labor force, men and women on whom they can rely. Dollars and cents are not everything; to men with families especially, good housing accommodation and congenial surroundings count for much. They constitute links which bind them to the firms, and are bars to that roving spirit which is prejudicial to production, and which, in the end, is of no benefit to the men.

Most men and women naturally prefer the large centres of industry where they, after business hours, obtain diversified methods of enjoyment. It is of course impossible for any industrial concern, with plants situated perhaps in secluded districts, to provide such recreations as exist in the larger towns and cities, but they can, and do, relieve the routine of work by giving facilities for certain forms of recreation. Nor are educational needs overlooked.

The companies are thus not only building up and maintaining an efficient, reliable, and contented body of workpeople, but they are engendering a spirit of loyalty which is so often lacking in many plants. It is a policy which benefits the companies and also their employees. The fact that the Abitibi Company is constructing additional houses is an indication that the policy has been a success at Iroquois Falls.

ANOTHER NEW PAPER MILL

It is reported that the Premier Paper and Power Company of Halifax has purchased the St. Croix Paper and Lumber Company, acquiring the latter's watershed and 26,000 acres of pulpwood, and is planning the early construction of a new paper mill and power plant to cost approximately $1,500,000. The mill will be 35 miles from Halifax, and will consist of two hydraulic turbines generating approximately 3,300 h.p. four water wheels to drive grinders, and one newsprint machine.

The Canada Paper Board Company's mill at Frankford will be closed down the greater part of July to instal new pumps and beaters, and to make changes in the wet end of their machine. These changes will increase the efficiency and output of the mill so that when completed there will be a total production of about 45 tons.

Tenders are invited for the purchase of interim certificates entitling the holder to bonds of the Great Eastern Paper Company, Limited, of the aggregate face value of $1,625,000. They are part of an authorized issue of an aggregate principal value of $2,000,000, falling due on Jan. 6, 1941. Tenders will be received at the head office Jan. 6, 1941, carrying half-yearly interest at 7 per cent. Tenders will be received at the head office of the United Financial Corporation, Limited, July 4, 1922.

REORGANIZATION OF U. S. PULP MANUFACTURERS' ASSOCIATION

A reorganization of the Pulp Manufacturers' Association, forced by the unfavorable manufacturing and financial conditions of the year and more of depression, in which the element of foreign competition had no small part, has resulted in this association being brought for the time being under the wing of the American Paper and Pulp Association. O. M. Porter, Assistant Secretary of the American Paper and Pulp Association, has become Secretary of the Pulp Manufacturers' Association, and will coordinate its work with that of the Woodlands Section, of which he is also Secretaary. The close relation between the Pulp Manufacturers Association, and the Woodlands Section of the American Paper and Pulp Association, will, it is expected, be a step to the adavantage of each group.

The retirement of H. H. Bishop, as Secretoary of the Pulp manufacturers, takes the dean of the paper association secretaries out of the industry. The change was only made after a long series of conferences in which Mr. Bishop's advice as to the method of continuing the work of the Pulp Manufacturers' Association was largely followed. Under the new arrangements, the Pulp Manufacturers' Association will retain its identity and individuality, but considerable saving in overhead will be effected, until such time as the association can return to its old plan of maintaining separate offices and office force.

Mr. Porter will continue as assistant to Dr. Baker, in addition to his new duties with the pulp manufacturers, but his attention will be largely devoted to the problems of the raw materials of the paper industry.

BIRD & SONS, LTD., OFFER STOCK

A. E. Ames & Co., Toronto, are making an offering of $400,000, 7 per cent cumulative preferred stock of Bird & Son, Limited, at 87.50 per share to yield 8 per cent.

The Bird industries are among the oldest on this continent, having their inception over one hundred and twenty-seven years ago. They have steadily grown under the direction of the Bird family for three generations, until today they are one of the largest manufacturers of asphalt roofing and allied products. These are marketed under the internationally known trade names — "Paroid". "Neponset" and "Bird's" so well known to every builder.

The company has no bonded indebtedness and no bonds may be issued without the consent of 75 per cent of the preferred shareholders. Net assets, exclusive of goodwill, are equal to over $226 against each share of preferred stock.

The net earnings for the past four years are at the rate of over 20 per cent on the preferred stock and are at the rate of over 20 per cent on the preferred stock and are at present at the rate of over 23.5 per cent. Dividends are payable quarterly.

MARKET FOR U. S. PAPER IN AUSTRALIA

The demand for paper in Australia is large and is partly supplied by Australian mills which manufacture printing, writing, blotting, and wrapping papers as well as strawboard and box board, reports Consul Edward J. Gordon at Sydney. Some fruit wrappers are imported from Norway and Sweden, practically none coming from the United States. The United States supplied 103 tons out of a total of 176 tons of blotting paper imported to Australia during the fiscal year ended June 30, 1920. During that same period the Commonwealth imported 2,730 tons of wrapping paper (in rolls), Canada supplying 1,098 tons and the United States 774 tons. Writing paper (sheets not less than 16 x 13 in.) was imported to the value of £435,497, and purchases from the United States reached the total of £220,018, the share of the United Kingdom, the next largest source of supply, being reported at £171,805.

Up to the present time only a small quantity of writing, printing, and wrapping papers are manufactured locally, and the paper manufacturing industry in Australia, while steadily developing, has not advanced as rapidly as expected, even with the higher rate of duties imposed by successive tariffs. Conditions are favorable for holding the trade the United States has developed and for increasing it in certain lines.

Paper cups are now being manufactured in Australia, chiefly from imported materials. It is rather doubtful whether it will be possible to do much in this line, but as costs of production are high in most local industries it may be found that the selling price of the Australian product is high enough to permit importation.

PULP AND PAPER EXPORTS

Exports of Canadian pulp and paper in May showed considerable improvement over the previous month and over the corresponding month of last year, according to a current report by the Canadian Pulp and Paper Association. The total value of the exports was $8,522,830, compared with $6,490,359 in April, and $7,929,525 in May, 1921.

The increase in exports in May was not confined to any single commodity, but was shared by all grades of pulp and paper; pulp exports showed an increase of approximately 70 per cent. over the April exports.

While the actual value, compared with the value in May, 1921, does not show a great increase, yet the quantity of the exports is appreciably greater than for last year in the case of newsprint paper and all grades of pulp, except ground wood.

The figures for the months of May, 1921 and 1922, are as follows:—

	May, 1921		May, 1922	
Paper:	Cwts.	Value.	Cwts.	Value.
Newsprint	883,557	$4,682,393	1,515,657	$5,361,102
Book Paper	1,364	18,909	562	4,544
Other Paper & Mfrs.	....	561,945	....	41,023
Total Paper . . .		$5,362,247		$5,779,669
	May, 1921		May, 1922	
Pulp:	Cwts.	Value.	Cwts.	Value.
Sulphate (Kraft) . .	158,050	$ 664,085	251,490	$ 763,505
Sulphite Blchd. . . .	88,369	508,642	336,698	1,106,525
Sulphite Unblchd. . .	187,398	739,263	225,537	594,580
Mechanical	326,299	754,288	238,244	278,551
Total Pulp . . .	760,116	$2,666,278	1,051,969	$2,743,161

The principal countries of destination of these exports in May, 1922, were:—

	Paper	Pulp	Ttotal
United States	$5,300,688	$2,633,453	$7,034,141
United Kingdom	119,331	67,822	187,153
All Others	359,650	41,886	401,536

Exports of pulpwood in May were 75,702 cords, valued at $740,287, compared with 49,076 cords, valued at $476,344, in April, and 54,914 cords, valued at $717,818, in May, 1921.

KIDDIE'S PRAYER

"Lord make my daddy careful to-day as I don't want to be an orphan."

bags, substituting sulphate for sulphite in the manufacture of news print, investigation of methods of testing carbon paper, routine testing, and information supplied to the general public. -A. P. -C.

A-0; E-1 The Oxidizing Action of Potassium Dichromate as Compared with that of Pure Iodine CARL R. McCROSKY. **J. Am. Chem. Soc.**, xl, 1662-1674, (1918). The author has studied the trustworthiness of potassium dichromate as a standardizing agent for iodometric determinations. It is shown that potassium dichromate always liberates more than the theoretical amount of iodine from hydriodic acid. -A. P. -C.

A-0 Colored Indicator Papers. I. M. KOLTHOFF. **Pharm. Weekblad**, lvi, 175-187, (1919); **Chem. Soc. Abs.**, cxvi, Pt. 2, 518, (1919). An examination of the sensitiveness of indicator papers with reference to the quality of the paper itself and its pretreatment with acid, alkali, or aluminium hydroxide, the nature of the coloring matter used, and its concentration on the paper. Sized papers are less sensitive than unsized, although the reaction on the former is sharper. Otherwise, the kind of paper used, and any previous treatment it may have had, are of little importance. The most sensitive Congo paper was obtained by treating filter paper with an 0.1 per cent solution of the dye. This indicated an acidity of 0.0001 **N** hydrochloric acid. The most sensitive paper for strong acids and bases is prepared from 0.1 per cent. solution of azolitmin. -A. P. -C.

E.— Acid Processes and Equipment for Pulp Making

E-1 Volumetric Estimation of Sulphurous Acid. THOS. J. I. CRAIG. **J. Soc. Chem. Ind.**, xxxviii, 96T, (1919). The sulphurous acid solution is added to a known excess of hydrogen peroxide solution acidified with dilute sulphuric acid, and the excess of hydrogen peroxide is then titrated with standard potassium permanganate solution. The reaction proceeds according to the equations $SO_2 + H_2O_2 = H_2SO_4$ and

$$5H_2O_2 + 2KMnO_4 + 3H_2SO_4 = K_2SO_4 + 2MnSO_4 + 8H_2O + 5O_2.$$

The method may also be appled to solutions containing sulphites or acid sulphites. -A. P. - C.

E-5 Method of Producing Pulp. Can. Patent No. 214, 492, B. M. E. L. POSSANNER VON EHRENTHAL and M. VON HALLE, Nov. 29, 1921. Vegetable materials which are difficult to treat by alkaline processes and which yield unbleachable pulp by the sulphite process are cooked with sulphite liquor having as high a content of combined sulphur dioxide as can be obtained without precipitating calcium monosulphite (3 to 4 per cent lime, 4 to 5 per cent sulphur dioxide) at a maximum pressure of 5 to 6 atmospheres, and maximum temperature of 125 to 130 degrees C., for 6 to 7 hours. The cooked material is defibered and washed, and treated for 1 or more hours at 80 to 90 degrees C. in a bleaching engine with a 5 to 10 per cent sodium carbonate (or better sodium hydroxide) solution. The resultant pulp can be easily bleached in the usual manner. The waste liquors from both the acid and the alkaline treatments are worked up for by-products. The precipitate obtained on neutralizing the alkaline waste liquor can be used as a cattle food. -A. P. -C.

E-0 Acidproof Mortar. Can. Patent No. 214.511 A. W. EKSTROM, Dec. 6, 1921. The mortar is made up of Portland cement 8 to 16 parts by volume, chamot 3 to 7 parts, alum slate 1 to 4 parts, to which may be added suitable filler. It is mixed with a suitable quantity of waterglass of suitable concentration just before using. The chamot renders the cement waterproof, the alum slate makes the mass ductile, and the waterglass is a binder, keeping the mass moist. -A. P. -C.

F.— Alkaline Processes and Equipment for Pulp Making

F-5 Process for Converting Esparto and Other Grasses into Paper Pulp. Fr. Patent No. 526, 765, SOCIETE MAUNOURY & CIE., July 8, 1921. **Papier,** xxiv, 545, (Dec. 1921). The chlorophyll, gums, fats, waxes, and pectocellulose are eliminated by treating with an alkaline liquor (sodium or potassium or carbonate) containing a calculated amount of "pectose" (depending on the nature of the plant and the amount of pectic compounds it contains) which is rendered soluble by the addition of 0.05 to 0.15 per cent. of disodium hydrogen phosphate (Na_2HPO_4). The material is then washed and subjected to the action of nascent chlorine gas or of one of its oxidizing salts. The resultant pulp is finally treated with an alkaline liquor at 100 degrees C. to dissolve out the silica. -A. P. -C.

F-5 Improvement in Esparto Cooking. ALFRED W. SMITH. **Paper,** xxix, No. 8, 22-24, (Oct. 26, 1921). A plea for a more thorough investigation of the relationship between the strength of liquor, steam pressure, and time of cook. -A. P. -C.

F-0 Agriculture and Paper Pulp. The Small Scale Manufacture of Straw Pulp by a Continuous Process. RAYMOND FOURNIER. **Papeterie,** xliv, 2-10, (Jan. 10, 1922). Owing to the seasonal nature of agricultural work, agricultural workers are employed but part of the time, and consequently very easily drift into cities where they find permanent employment. To help overcome this, the author suggests that during the late fall and winter the farmers transform their straw into paper pulp, which may be of varying quality according to the treatment to which it is subjected. The process described is simple, does not require very complicated apparatus, and is continuous. The equipment comprises a (preferably two-storey) building with power, heating system, and water system, a straw cutter, duster, automatic straw distributor, cooker for the continuous cooking of the straw (by the soda process), disintegrator, apparatus for recovering the spent liquor, washer, machine for making the pulp into sheets, and, if need be, dryers for drying the pulp. The process, which is entirely continuous, is described at some length. The yield can vary from 37 to 70 per cent according to the amount of caustic used, the time of cooking, and the method of operating the disintegrator, the lower yields giving a higher grade and better finished pulp. -A. P. -C.

H.— Bleaching and Equipment

H-1 Estimation of Alkali Hydroxide and Alkali Carbonate in Alkali Hypochlorite Solution. M. PHILIBERT. **J. Pharm. Chim.**, xviii, 260-272, (1918); Chem. **Soc. Abs.**, cxvi, Pt. 2, 79, (1919). The total alkalinity is found by treating a portion of the sample with a measured excess of decinormal hydrochloric acid and potassium iodine solution, titrating the liberated iodine with thiosulphate solution, then adding potassium iodide-iodate solution and again titrating the iodine with thiosulphate solution; the latter titration is a measure of the quantity of the added acid which remains uncombined, and the difference corresponds to the alkalinity of the sample. To estimate the free alkali hydroxide another portion of the sample is treated with a measured quantity of decinormal barium hydroxide solution, barium chloride solution is also added, the mixture diluted to a definite volume, filtered, and the alkalinity of the filtrate titrated as described above. The difference between the quantities of free and total alkali gives the amount of alkali carbonate. -A. P. -C.

H-1 The Estimation of Free Alkali or Alkali Carbonate Alone or in the Presence of Alkali Hypochlorite. W. MESTREZAT. **J. Pharm. Chim.**, xx, 9-14, (1919); **Chem. Soc. Abs.**, cxvi, Pt. 2, 427, (1919). Cf. preceding and following abstracts. Alkali hypochlorite solution, containing no free alkali hydroxide or carbonate, is neutral towards reagents after the hypochlorite has been decomposed by thiosulphate. Free alkali or alkali carbonate in such solution can, therefore, be titrated; alkali carbonates, in the cold and in concentration not exceeding $\frac{N}{80}$, are alkaline towards phenolphthalein, but the alkalinity disappears when the titration has proceeded to the formation of alkali hydrogen carbonate. -A. P. -C.

H-1 Estimation of Free Alkali Hydroxide and Carbonate in Alkali Hypochlochlorite Solution. M. PHILIBERT. **J. Pharm. Chim.**, xx, 52-55, (1919); **Chem. Soc. Abs.**, cxvi, Pt. 2, 427, (1919). Cf. two preceding abstracts. A reply to Mestrezat. The author maintains the trustworthiness of the iodo-acidimetric mehtod. -A.P.C.

H-0 Alkali Hypochlorites: Free or Combined Salts. ED. JUSTIN-MUELLER. **J. Pharm. Chim.**, xx, 113-115, (1919); **Chem. Soc. Abs.**, cxvi, Pt. 2, 464-465, (1919). Reasons and evidence are adduced to show that alkali hypochlorites have the formula X_2OCl_2 or NaOCl, the constituents in the latter formula being combined to form a single molecule. The similarity between the reactions of calcium hypochlorite and alkali hypochlorites favors the combined salt view, as does also the decomposition of calcium hypochlorite by sodium carbonate: $CaOCl_2 + Na_2CO_3 = Na_2 + CaCO_3$. The reaction between a hypochlorite and sulphuric acid would be represented by the equation $Na_2OCl_2 + H_2SO_4 = Na_2SO_4 + Cl_2 + H_2O$, whilst the equation $NaOCl + NaCl + H_2SO_4 = Na_2SO_4 + Cl_2 + H_2O$ would be representative of the reaction if the hypochlorite consisted of NaOCl. -A. P. -C.

L.— Articles Produced from Pulp and Paper

L-4 Fiber Containers Displacing Wooden Cases. Pulp and Paper, xix, 641-642, (June 16, 1921). The advantages of fiber containers over wooden cases are: lighter, cheaper, occupy less space, can be folded up when empty, can be printed at the time they are made. An example is given of a shipment of 100 cases each containing 48 1 lb. cans of Nestle's Condensed Swiss milk from Cass City, Mich., to various places in England. During the overseas voyage the cases came in contact with a considerable amount of water, but only 3 of the cases showed the slightest damage. Considerably more damage was done to the cans when shipped in wooden cases and subjected to severe saturation by water. -A. P. -C.

N.— Power Generation and Equipment

N-4 Steam Consumption in Paper Mills. R. L. WELDON, St. Lawrence Paper Mills, Ltd. **Pulp and Paper**, xx, 45-49, (Jan. 19, 1922); **Paper Trade J.**, lxxiv, No. 6, 43-47, (Feb. 9, 1922). The most important use of steam in the paper mill is that of drying the paper, and intimately linked with it is the question of power, since in many mills it is customary to generate a certain amount of the power by means of steam, the exhaust being used to dry the paper. The important factors affecting steam consumption for drying are moisture content of the paper entering the dryers, efficiency of the condensate evacuating system, ventilation, condition of dryers both inside and outside, amount of dryer surface, felt dryers, clothing. A formula is given expressing the ideal steam consumption per pound of paper as on the machine for a given condition. Heat balances have been worked out for three systems: live steam drying, steam turbine, and uniflow engine; showing under what conditions each one is most advantageous. -A. P. -C.

N-6 Generation of Steam By Electricity. F.T. KAELIN, Shawinigan Water & Power Co., Montreal. **Can. Chem. Met.**, vi, 59-62, (March 1922). The electric steam generator is the result of a condition which leaves available for a portion of the day or year an excess of power over and above that required for manufacturing purposes. The article illustrates the usefulness and limitations of such apparatus in supplementing or even replacing boiler plants. The efficiency of electric steam generators is about 96 to 99 per cent., being higher for large sizes. They may be divided into two main and distinct classes: generators in which the current passes through a combination of metallic resistors, and generators in which the water itself forms the electric resistance. Generators of the first type are suitable only for voltages up to about 500, and have been built up to 1,500 K. W. capacity. The space occupied is relatively large as compared with the steam generating capacity. Generators of the second type can use comparatively high voltages (up to 12,000 volts), obviating the use of step-down transformers and reducing the cost of installation. Changes in load are followed by regulating the electric input by varying the electric resistance either by changing the submersion of the electrodes or varying the specific resistance of the water by suitably adjusting the amount of water fed to the generator and by controlling the water discharged. The outstanding advantages of this type of generator are: simplicity of construction, compactness, ease of control, and low cost per k.w. capacity. The relation between the temperature and resistance of water is given by $R = \frac{C}{\sqrt{T}}$, in which **R**= ohms per cubic inch, **T** the temperature of the water in degrees C., and **C** a constant depending on the impurities present in the water. It was first thought that the investigation of the relation between the temperature and resistance of different kinds of water would be of very great importance, but it has been found by experience in the operation of the steam generator that the resistance of the water could be controlled over a considerable range by discharging a suitable amount of water from the generator, the purer the water the less had to be discharged to maintain a suitable conductivity. The construction of a 5,000 k.w. generator is described at length, and also the arrangement of a three-tank unit to form one generator which may have capacities up to 25,000 k.w. The operating advantages are mentioned. -A. P. -C.

R.— General

R-12 Selling Scientifically and Manufacturing Methodically. T. J. BURKE, Secretary-Treasurer, Cost Association of the Paper Industry. **Paper**, xxviii, 11 13, (Aug. 31, 1921); **Paper Trade J.**, lxxiii, 52, 56, (Sept. 1, 1921); **Paper Industry**, iii, 853-857, (Sept. 1921); **Pulp and Paper**, xix, 997-998, (Sept. 29, 1921). A discussion of the importance of a proper cost system for the fixing of the selling policy, especially in unsettled conditions such as those which we are at present going through. -A. P. -C.

R-12 Paper Mill Management. E. ARNOULD. **Papier**, xxiv, 489-491, (Nov. 1921). A brief and general discussion of the qualifications required of a good paper mill manager. -A. P. -C.

The Markets

CANADIAN TRADE CONDITIONS

Montreal, June 27. — The improvement noted in our last issue has been maintained. There is a more optimistic feeling in practically all departments. Nobody expects a boom, but there a strong belief that business will gradually and positively expand. There are signs of that revival, and that, too, at a season when we generally look for a slackening of orders. The jobbers state that consumption is on a fair scale, and that increased trade may be looked for.

A factor which should make for this broadening is the almost certainty of a reduction in railway rates, now overdue. The proposals of the railway (involving a loss of $16,000,000), being on basic commodities would not afford the complete relief asked for by the Canadian Pulp and Paper Association. The reduction of 10 per cent enacted by the U. S. Interstate Commerce Commission, effective July 1, is of considerable importance to the pulp and paper industry, having regard to the great volume of exports shipped to the U. S.

The newsprint mills show no let up in activity. Paper is being manufactured and shipped with the utmost despatch. As an instance, we may state that one day last week, the Abitibi Company made 475 tons, only 9 tons below the record run. The only disturbing factor is the U. S. railway situation. Acute trouble there will involve dislocation of transportation facilities to a very serious extent, although some mills are fortunately in a position to make shipments by water.

Book and fine papers meet with a good demand; toilets and tissues are selling well, and wrappings have improved. Boards are picking up, but are still subjected to stiff competition from across the border. The recent briskness in roofing papers continues, there being an excellent demand from all parts of the province. Rags are in moderate supply, with a hardening tendency in white descriptions.

Considerable quantities of book papers are being exported to Australia, where Canada is meeting the competition from Great Britain.

The pulp markets are looking up. The export figures for May show substantial increases in chemical pulps, although the values indicate a drop in prices. Groundwood is still the weakest spot. The outlook is for a continuance of the better demand for chemical pulps.

Pulpwood is very slow of sale. Last week an American mill purchased several thousand cords at a low price.

Toronto Topics

Business conditions continue to develop along favorable lines and as the Summer progresses some lines report Fall business showing signs of improvement, though this trade is quite belated. Retailers are not stocking to any marked extent in spite of the more optimistic views held in most quarters.

In the West one factor that seems a little disturbing is the question of whether this season's crop will be expected to finance the last year's losses. In other words whether there will be any serious effort made to collect on outstanding obligations, or whether these may be spread. The latter course is more likely, but it is felt that the uncertainty is reacting adversely on buying operations in many areas where prospects of good harvest might reasonably be expected to induce better conditions.

Market Notes

Pulp markets have a firmer tendency with unchanged nominal prices, though we would not be surprised to hear of higher prices for sulphite.

Ground Wood delivered $30 to $35.

Sulphite delivered. News grade around $60, Book around $65, bleached $80 to $90.

Sulphate delivered, $70.00.

Book and Writing continues in fair activity.

Board Mills report good business.

Coated Paper is quiet. This line is affected by conditions in the printing trade.

Wrappings—Car lots.
No. 1 Kraft M. F., $8.00; M. G. $8.15.
Colored Sulphite $8.00.
Colored Kraft, 9¾c. to 10¾c.
B. Manila $5.50.
No. 1 Manilla $6.75.
Fibre Manilla $6.75.

Bags—Light Manilla 62½ p.c., 7½ p.c. off 100 M lots.
Heavy Manilla 60 p.c. off 100 M lots.
Light Kraft 60 p.c. off 100 M lots.
Heavy Kraft 50 p.c., 10 p.c. off 100 M lots.
White Confect. 17½ p.c., 10 p.c. off 100 M lots.

Tissues—No. 1 Manilla 20 x 30 30c., 24 x 36, $1.05.
Natural White 20 x 30, 90c., 24 x 36, $1.25.
No. 1 white 20 x 30, $1.10; 25 x 36, $1.55.
Manilla Sulphite 20 x 30, $1.00; 24 x 36, $1.40.

Towels—Car lots.
Interfolding, per case, $5.63 net.
Bleached White, rolls of 150 towels less 22 p.c.
(50 rolls to case.)
Natural, rolls of 150 towels less 22 p.c.
No. 3 Towels, rolls of 150 towels, less 22 p.c.

Toilets—Car lots. List price less 20 p.c. and 25 p.c.

Paper Stock—Canadian Market for paper stock is dull, but this is offset by an active export trade.
No. 1 Hard White Shavings, $3.75.
No. 1 Soft White Shavings, $3.40.
Heavy Books and Magazines, $1.70.
Ledgers and Writings, $1.95.
No. 1 Kraft, $2.00 to $2.25.
Newspapers, 70c. to 80c.
No. 1 Mixed Papers, 60c.
No. 1 Miscellaneous mixed, 55c.
Cotton Rags No. 1 White, nominal.
Thirds and Blue (repacked) $1.90 t $2.00.
New Cotton Cuttings, 4c to 5c.
Fancy Shirt Cuttings, 4c to 5c.
No. 1 White Shirt Cuttings, 9½c to 10½c.
Canton Flannels Bleached, 8c. to 8½c.
White Lawns, 7c. to 7½c.
Blue Overall Cuttings, 5c to 5½c.

Ropes and Bagging.—No. 1 Scrap Bagging, $17.50.
No. 1 Manila Rope 5¼c. to 5½c.
Mixed Strings, $16.00 to $17.00.

There is a good demand for No. 1 White Shirt Cuttings, unbleached manila and white canton flannels.

Manila Rope is still moving to mills at good prices.

Spanish River Pulp and Paper Mills, Limited, reports that its three mills have reached a record production of 650 tons of newsprint per day.

NEW YORK MARKETS

New York, June 24. — (Special Correspondence)— Reports coming from numerous sources tell of a marked increase in activity in the box board manufacturing industry. Board mills are said to be operating at present at a larger rate of production than at any time since the war days, and the movement of boards of nearly all kinds is undergoing steady expansion. Paper box manufacturers are buying with greater freedom than in a long time, and, under the stimulus of broader buying and a stiffening raw material market, prices on boards have been advanced substantially during the past few days. Mills in the Eastern part of the States are now quoting $37.50 per ton f.o.b. New York as a minimum on plain chip board, and about $40 a ton on filled news board. These prices represent those which the lowest sellers name; a large majority ask higher figures, in the vicinity of $40 on chip and $42.50 on news board being nearer an average quoted.

Many in the paper trade view the pick-up in board business as the forerunner of what is to come in the paper industry in general during the next few months. It is pointed out that paper board is invariably the first product of the paper industry to feel improvement in business, and also that it is usually at about this season of the year when paper box manufacturers begin to prepare for their fall rush period that board demand quickens. Many see in the substantial growth of board business recently an indication of a similar increase in demand for various grades of paper between now and the autumn, and it can be stated that the prevailing condition of the box board market is serving to materially add to the confidence in the outlook felt by paper manufacturers and jobbers.

Despite the very favorable situation that has developed for paper board, newsprint appears to be still in the most active market position of any kind of paper or board. Demand for print paper continues exceedingly brisk, and there has been no diminishment of activity at producing centres. Mills are working at close to full capacity and are shipping out paper about as rapidly as it is ready to be shipped. Prices on newsprint hold firm. Everyone seems of the opinion that print paper prices are at the bottom and there is no more uncertainty regarding market levels. In fact, a consensus of belief is that any revision in newsprint prices during the next few months will certainly be in an upward direction. Consumption is running at a rate which compares favorably with the best periods that paper manufacturers have ever experienced in the past, and there are prospects of more paper being used during the coming fall and winter months than ever in history of the industry. Moreover, the fact should not be lost sight of that from now on newsprint production costs are likely to mount. Manufacturers will soon have to commence using higher-priced pulp wood, while labor costs seem fully deflated with little probability of any further decrease in this expense. Foreign competition in the newsprint market also is lessening; all of these factors cause the trade to take a very bullish view of the print paper outlook.

This is the time of the year when consumption of coarse papers is low, and, coming just now when foreign competition in wrapping papers is very keenly felt, the market for this class of paper is not characterized by any too firm a tone. Prices are rather easy, as would be expected under the circumstances, and there is some selling pressure exerted on buyers, which causes them to hold back in placing orders. Tissue papers are only moderately active, also being affected by the seasonal slowing down

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of demand. Fine papers are in steady call, with the movement from mills gradually increasing and with quotations exhibiting a firm tone. Book papers are in no worse a position than recently and are in much better demand than several months ago but there is still great room for improvement in the market for this kind of paper. Price-cutting appears to be still the order of the day, this being due largely to mills' efforts to land as much of the available business as they can. With general business better and with advertising on the increase, however, book paper manufacturers have much to expect from the future.

GROUND WOOD. — Heavy rains in various parts of the country are said to be in numerous cases interfering with grinding operations at pulp mills; the swollen condition of rivers making for a situation where grinders have too much water. Later in the year when the customary summer drought sets in just the opposite will likely be the case — mills will have to reduce their operations because of not enough water. Present stocks of ground wood seem to be ample to cover current requirements.

CHEMICAL PULP. — Quotations on imported wood pulp display a stiffening tendency, and importers seem much less inclined to grant price concessions than in some time, this being due, it is said, partly to a better demand from paper mills in this country and partly to stronger primary pulp markets in Europe. On the other hand, there are reports which allege that domestic pulp of at least some kinds is not so firm in price. Domestic bleached sulphite producers are reported accepting orders for July delivery in frequent cases at lower prices than at which last contracts were made, it being stated that No. 1 bleached sulphite is being sold at 4 to 4.25 cents a pound at pulp mills. Generally speaking there is a good movement of sulphite, kraft and soda pulps.

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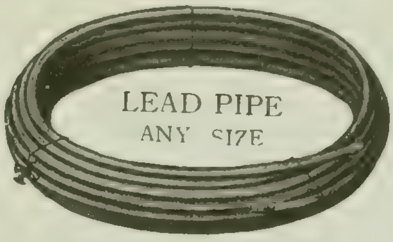

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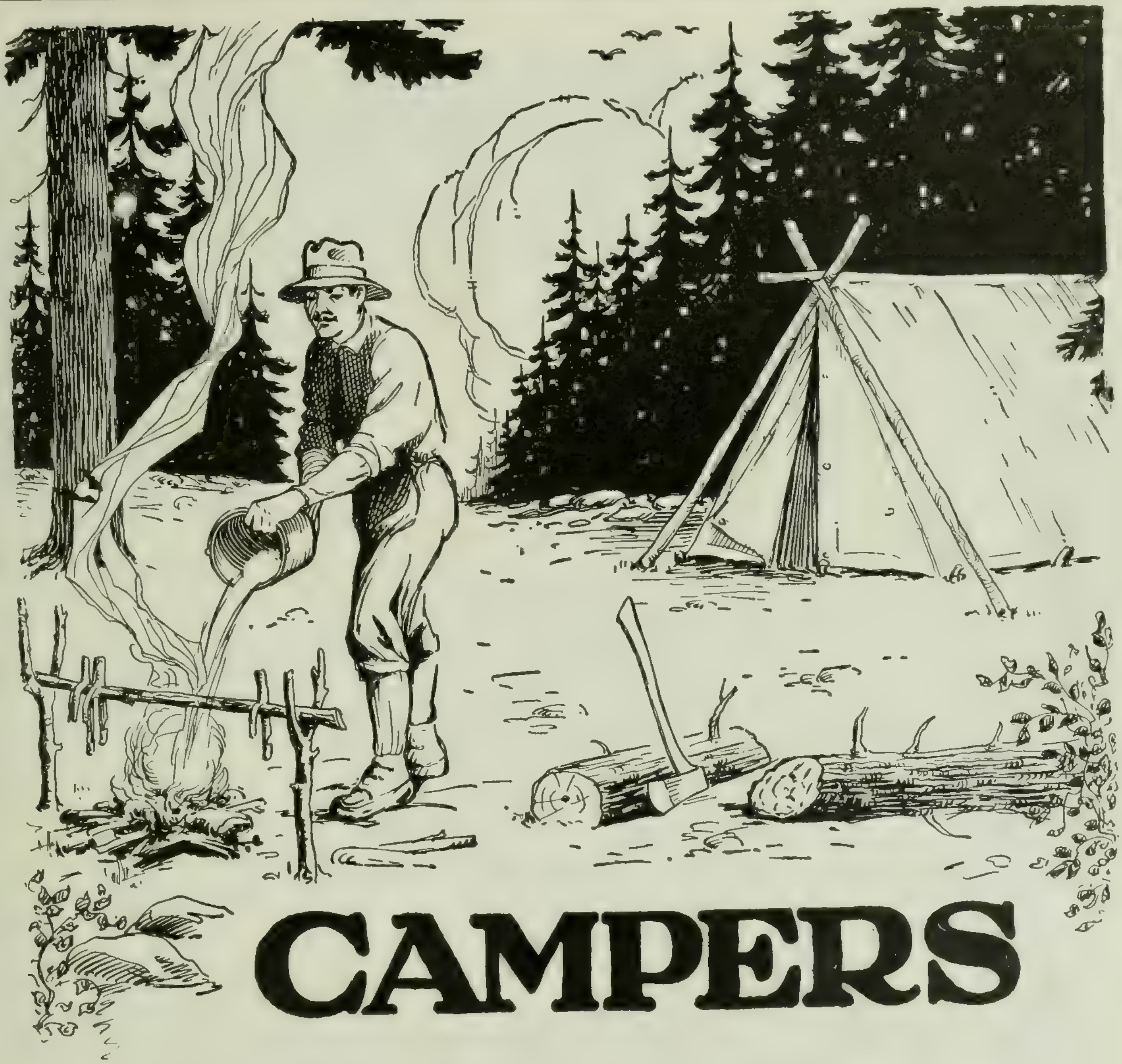

CAMPERS

ONTARIO'S forest wealth is dwindling. Every year forest fires take disastrous toll. Careless campers cause eleven per cent. of Ontario's forest fires. Last summer 112 cases of neglected camp fires were reported. This summer be careful.

When you build your fire to make tea, fry bacon or add cheer to pipe and story-telling time, use a woodman's precautions.

The real woodsman builds his fire on an old fireplace, if there be one handy. Failing that he scrapes away all litter, moss and fibrous rotted wood down to the mineral soil, or the bare rock, and preferably some place close to the water. He knows that if fire gets into the moss or the upper woody layer of forest soil, or in a half-rotted log or stump, it "holds over", burns away unnoticed underneath, and unless followed up and carefully put out, is liable to break into a flame later. He knows how hard it is to put such deep-smouldering fire out. So he makes his cooking fire surprisingly small and compact, and chooses a spot that is absolutely safe.

It is a mark of his finished woodsmanship how thoroughly he drowns his fire out with plenty of water when he is through with it. Save the forests. You may want to camp again.

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Carthage Machine Co.
Goldie & McCulloch Co., Ltd.
Hydraulic Machinery Co., Ltd.
Port Arthur Shipbuilding Co.,Ltd.
Northern Foundry & Machine Co.
Victoria Foundry, Ltd.
Waterous Engine Works Co., Ltd

Heaters—Feed Water:
Mason Regulator & Eng. Co., The
Sturtevant, B. F. Co., of Canada, Ltd

Heating and Ventilating:
B. F. Sturtevant Co. of Canada, Ltd
Ross, J. O. Engineering Co.

Hoists:
Canadian Fairbanks-Morse Co., Ltd
Canadian Ingersoll-Rand Co., Ltd.
Canadian Link-Belt Co., Ltd.
Gould, Shapely & Muir Co., Ltd.
Hamilton, William Co., Ltd.
Northern Crane Works, Ltd.
Victoria Foundry, Ltd.

Hoods—Paper Machine:
Taylor, Ltd., H. S.
Williams Apparatus.

Hydrants—Fire and Mill Yard:
Norwood Engineering Co.

Hydraulic Presses:
Hydraulic Machinery Co., Ltd.
Northern Foundry & Machine Co.
Waterous Engine Works Co., Ltd

Instruments—Testing:
The Bristol Co.
Foxboro Co., Inc.
Northern Electric Co., Ltd.
Perkins, B. F. & Son, Inc.

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Northern Electric Co., Ltd.

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See Castings:

Jordan Engines:

Emerson Mfg. Co.
Hamilton, William Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.

Jordan Fillings:

J. W. Bolton & Sons, Inc.
Pulp & Paper Mill Accessories, Ltd
Tippet & Co., Ltd.

Knife Grinders:

Carthage Machine Co.

Knives:

J. W. Bolton & Sons, Inc.
Can. Des Moines Steel Co., Ltd.
Canadian Fairbanks--Morse, Co., Ltd.
Carthage Machine Co.
Galt Knife Co., Ltd.
Hamblet Machine Co.
Peter Hay Knife Co., Ltd.
Pulp & Paper Mill Accessories, Ltd
Waterous Engine Works Co., Ltd

Knives Paper Cutting:

Galt Knife Co., Ltd.
Hamblet Machine Co.
Peter Hay Knife Co., Ltd.
Pulp & Paper Mill Accessories, Ltd
Reid, C. De Wolf.

Kollergangs:

Bertrams, Ltd.
Boving Hydraulic & Eng. Co., Ltd.

Lamps—Electric:

General Electric Co., Ltd.
Harland Engineering Co., Ltd.
Northern Electric Co., Ltd.

Laboratory Equipment:

Perkins, B. F. & Son, Inc.

Lath Machines:

Victoria Foundry, Ltd.

Lead Burning:

Barber, W. J. & Co.
St. Lawrence Welding Co.

Lead Goods:

The Canada Metal Co., Ltd.
McAvity, T. and Son.

Locomotives:

Fraser & Chalmers, Canada, Ltd.
Jno. J. Gartshore.
Montreal Locomotive Works, Ltd.

Lubricants:

Imperial Trading Co.

Lubricating Graphite:

Dominion Paint Works, Ltd.

Lubricators:

Canadian Fairbanks-Morse Co., Ltd.
Imperial Trading Co.
McAvity, T. & Son.

Matches:

E. B. Eddy Co., Ltd.

Machine Tools:

Canadian Fairbanks-Morse Co., Ltd.
Victoria Foundry, Ltd

Mechanical Draft:

The Mason Regulator & Eng. Co., Ltd.
Sturtevant, B. F. Co., of Canada, Ltd

Meters—Steam:

The Bristol Co.
Foxboro Co., Inc.
The Mason Regulator & Eng. Co.
Peacock Bros., Ltd.

Motors:

Canadian Fairbanks-Morse Co., Ltd.
Canadian General Electric Co., Ltd.
Harland Engineering Co., Ltd.
Northern Electric Co., Ltd.
Sturtevant, B. F. Co., of Canada, Ltd.

Mill Brokers:

Can. Woodlands & Pulpwood Agency
Gibbs-Brower Co., Inc.

Motor Drives—Individual, Sectional:

Can. General Electric Co., Ltd.
Can. Westinghouse Co., Ltd.
Harland Eng. Co., Ltd.

Oil:

The Barrett Co., Ltd.

Oxy-Acetylene Welding and Supplies:

Walsh Plate & Structural Works, Ltd.

Packing:

Beveridge Supply Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.

Paints —
(Concrete Floor Hardener, Flat Machine Paint, Lubricating Graphite Paint, Machine Paints, Mill White, Pipe Joint Cement, Rust Resisting Paint, Structure Steel Paint, Varnish):
Dominion Paint Works, Ltd.

Paints:

Dominion Paint Works, Ltd.
Barrett Co., Ltd.
Dominion Paint Works, Ltd.
McArthur, Irwin, Ltd.

Pinions:

Hamilton Gear & Machine Co.

Pulp Stones:

American Stone Co.

PAPER AND PULP

Bonds—Bristols, Ledgers, Writing:

Beveridge Supply Co., Ltd.
E. B. Eddy Co., Ltd.
Provincial Paper Mills Co., Ltd.
Rolland Paper Co., Ltd.

Book and Coated:

Beveridge Supply Co., Ltd.
Provincial Paper Mills Co., Ltd.
Rolland Paper Co., Ltd.

Boxboard:

Acer, J. H. A. & C.., Ltd.
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co.
Canada Paper Board Co.
Eddy, E. B. & Co.
Price Bros. & Co. Ltd.
Reid, C. De Wolf.

Genuine Vegetable Parchment:

Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Greaseproof Paper:

Beveridge Supply Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
Diamond State Fibre Co., of Can., Ltd
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Groundwood Pulp:

Abitibi Power & Paper Co., Ltd.
Acer, J. H. A. & Co., Ltd.
American Woodpulp Corp.
Brompton Pulp & Paper Co., Ltd.
Donnacona Paper Co.
M. Gottesman & Co., Inc.
Interstate Pulp & Paper Co., Inc.
Laurentide Co., Ltd.
Lagerloef Trading Co., Inc.
Price Bros. & Co., Ltd.
Relph, Darwen & Pierce
St. Maurice Paper Co.
Scandinavian American Trading Co.
Spanish River Pulp & Paper Mills

Kraft Paper:

Acer, J. H. A. & Co., Ltd.
Beveridge Supply Co., Ltd.
Bathurst Lumber Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Dryden Pulp & Paper Co., Ltd.
M. Gottesman & Co., Inc.
Price & Pierce, Ltd.
Victoria Paper & Twine Co., Ltd.
Wayagamack Pulp & Paper Co., Ltd.

Lumber and Wood Products:

Brompton Pulp & Paper Co
Eddy, E. B. Co., Ltd.
Price Bros & Co., Ltd.

Mill Wrappers:

Acer, J. H. A. & Co., Ltd.
Brompton Pulp & Paper Co., Ltd
Eddy, E. B. & Co., Ltd.
Price Bros & Co., Ltd.

Nickle Alloy:

Beveridge Supply Co., Ltd.

Newsprint:

Abitibi Power & Paper Co., Ltd.
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co., Ltd
E. B. Eddy Co., Ltd.
J. Ford & Co.
Laurentide Co., Ltd.
Patton, J. F., Inc.
Price Bros & Co., Ltd.
Spanish River Pulp & Paper Mills
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Dryden Pulp & Paper Co., Ltd.

St. Maurice Paper Co.

Roofing:

J. Ford & Co.
Interstate Pulp & Paper Co., Inc.
Spanish River Pulp & Paper Mills

Parchment:

Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Specialties:

Beveridge Supply Co., Ltd.
Diamond State Fibre Co., of Can., Ltd
Can. Nashua Paper Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Price Bros & Co., Ltd.
Smith Howard Paper Mills.
Victoria Paper & Twine Co., Ltd.

Soda Pulp:

M. Gottesman & Co., Inc.

Sulphate Pulp (Kraft):

American Woodpulp Corp.
Bathurst Lumber Co., Ltd.
Brompton Pulp & Paper Co., Ltd
M. Gottesman & Co., Inc.
Dryden Pulp & Paper Co., Ltd.
Lagerloef Trading Co., Inc.
Wayagamack Pulp & Paper Co., Ltd

Sulphite Pulp :

Abitibi Power & Paper Co., Ltd.
Acer, J. H. A. & Co., Ltd.
American Woodpulp Corp.
Donnacona Paper Co.
M. Gottesman & Co., Inc.
Lagerloef Trading Co., Inc.
Laurentide Co., Ltd.
Mattagami Pulp & Paper Co., Ltd.
Price Bros. & Co., Ltd.
Riordon Sales Co., Ltd.
Spanish River Pulp & Paper Mills. Ltd.
St Maurice Paper Co.
Smith Howard Paper Mills.

Tissue and Toilet:

Beveridge Supply Co., Ltd.
Can. Vegetable Parchment Co., Ltd
E. B. Eddy Co., Ltd.
Garden City Paper Mills Co., Ltd.
Interlake Tissue Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Wrapping:

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Brompton Pulp & Paper Co., Ltd.
Can. Vegetable Parchment Co., Ltd
Dryden Pulp & Paper Co., Ltd.
E. B. Eddy Co., Ltd.,
Garden City Paper Mills Co., Ltd.
Interlake Tissue Mills Co., Ltd.
Spanish River Pulp & Paper Mills
Victoria Paper & Twine Co., Ltd.
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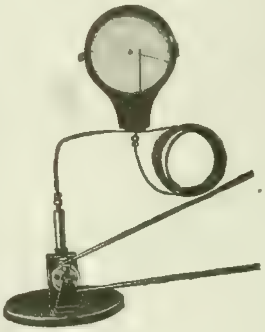

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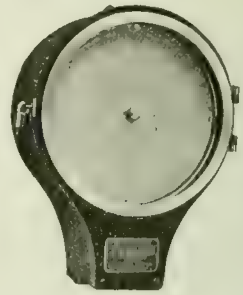

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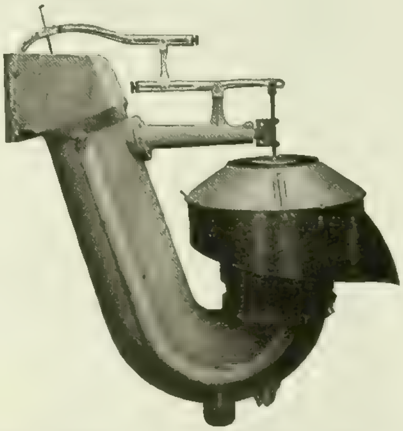

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Pulp & Paper Trading Co.

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The Barrett Co., Ltd.
Beveridge Supply Co., Ltd.

Paper Bags:
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E. B. Eddy Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Packing:
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Paper Cores:
Elixman Paper Core Co.

Paper Cutting Machines:
Walmsley, Charles & Co., Ltd.

Paper Genuine Vegetable Parchment:
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Bertrams, Ltd.
Black-Clawson Co.
Boving Hydraulic & Eng. Co., Ltd
Canadian Fairbanks-Morse Co., Ltd
Carthage Machine Co.
Dominion Engineering Works, Ltd.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Hamilton Co., Ltd., Wm.
Hydraulic Machinery Co., Ltd
Johnson C. H. & Sons.
Norwood Engineering Co.
MacKinnon Steel Co., Ltd.
McAvity & Sons, Ltd., T.
Mills Works & Machinery, Ltd.
Morrison, J. L. Co.
Port Arthur Shipbuilding Co., Ltd.
Perkins, B. F. & Son, Inc.
Pulp & Paper Mill Accessories, Ltd
Reid, Cl de Wolf.
Pusey & Jones Co.
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Smith, Morgan Co.
Stebbins Eng. & Mfg. Co.
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Ticonderoga Machine Works.
Walsh Plate & Structural Works, Ltd
Walmsley, Chas. & Co.,
Waterous Engine Works, Co., Ltd.
Westbye, P. P.
Wolf, R. B. Co.

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Waterous Engine Works, Co., Ltd.

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Dominion Engineering Works, Ltd
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Hamilton, William Co., Ltd.
MacKinnon Steel Co., Ltd.
Walsh Plate & Structural Works, Ltd
White, W. H.

Penstocks, Wood Stave:
Pacific Coast Pipe Co., Ltd.
White, W. H.

Pillow Blocks:
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Port Arthur Shipbuilding Co., Ltd.
Victoria Foundry Co., Ltd.
Waterous Engine Works, Co., Ltd.

Pipes:
Tallman Brass & Metal Co., Ltd.

Piping—High Pressure:
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Crane, Ltd.
McAvity & Sons, Ltd., T.
Northern Foundry & Machine Co.
Port Arthur Shipbuilding Co., Ltd.

Piping Hydraulic:
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Dodge Manufacturing Co.
Hydraulic Machinery Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.

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Candian Ingersoll-Rand Co., Ltd.
Can. Chicago Bridge & Iron Co., Ltd
Dominion Engineering Works, Ltd.
Goldie & McCulloch Co., Ltd.
Hamilton, William Co., Ltd.
Horton Steel Works, Ltd.
MacKinnon Steel Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Walsh Plate & Structural Works, Ltd.
Waterous Engine Works Co., Ltd.

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Waterous Engine Works, Co., Ltd.

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Canadian Ingersoll-Rand Co., Ltd.
Hydraulic Machinery Co., Ltd.
Northern Foundry & Machine Co.
Port Arthur Shipbuilding Co., Ltd

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Dominion Engineering Works, Ltd.
Hydraulic Machinery Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Sherbrooke Machinery Co., Ltd.
Waterous Engine Works, Co., Ltd.

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Canadian Fairbanks-Morse Co., Ltd.
Dominion Engineering Works, Ltd.
Diamond State Fibre Co. of Can., Ltd.
Hamilton, William Co., Ltd.
Northern Foundry & Machine Co., Ltd.
Victoria Foundry, Ltd.
Waterous Engine Works, Co., Ltd.

Pulp Slashers:
Hamilton, William Co., Ltd.

Pulp Stones:
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Beveridge Supply Co., Ltd.
International Pulp Stone Co.
Imperial Trading Co.
Lombard & Co.
Miramichi Quarry Co., Ltd.
Smallwood Stone Co.
Smallwood-Low Stone Co.

Pulp Thickeners:
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Pulp & Paper Mill Accessories, Ltd
Port Arthur Shipbuilding Co., Ltd.

Pulp Wood:
Crittsinger, Burt C.

Pumps:
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Boving Hydraulic & Engineering Co. Ltd.
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Canadian Ingersoll-Rand Co., Ltd.
Carthage Machine Co.
Darling Bros., Ltd.
Dominion Engineering Works, Ltd.
Downingtown Mfg. Co.
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Goold, Shapley & Muir Co., Ltd.
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Hamilton, Wm. Co., Ltd.
Harland Engineering Co., Ltd.
The Mason Regulator & Eng. Co
Lawrence Machine Co.
McAvity, T. & Son.
Northern Foundry & Machine Co.
Ontario Wind Engine and Pump Co., Ltd.
Peacock Bros., Ltd.
Port Arthur Shipbuilding Co., Ltd
Smart-Turner Machine Co. Ltd
Sherbrooke Machinery Co., Ltd.
Victoria Foundry, Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.
Weir, Ltd., G. & J.

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Can. Farnsworth Co., Ltd.
Goldie & McCulloch Co., Ltd
Harland Eng. Co., Ltd
Mason Regulator & Eng. Co.
McAvity & Sons, Ltd., T.
Northern Foundry & Machine Co., Ltd.

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The Mason Regulator & Eng. Co.

Rag Cutters:
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Rag Cutter Knives:
J. W. Bolton & Sons, Inc.
Pulp & Paper Mill Accessories, Ltd

Rails—Re-laying:
Gartshore, J. J.

Recording Ammeters:

Recording Wattmeters:
The Bristol Co.

Recording Instruments:
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The Bristol Co.
Peacock Bros., Ltd.

Refiners:
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Boving Hydraulic & Eng. Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.

Regulators—Steam.
Beveridge Supply Co., Ltd.
Mason Regulating & Eng. Co., Ltd.
Pickles, W. F.

Regulators:
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Rods—Copper, Brass and Bronze:
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Tallman Brass & Metal, Ltd.

Rods—Welding:
Tallman Brass & Metal, Ltd.

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Beveridge Supply Co., Ltd.
Can. Johns-Manville Co., Ltd
Reed & Co., Ltd., Geo. W.

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Jones & Glassco.
Goldie & McCulloch Co., Ltd.

Rosin Size:
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Union Screen Plate Co. of Canda.
Waterous Engine Works, Co., Ltd.

Screens:
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Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Link-Belt Co., Ltd.
Carthage Machine Co.
Hamilton, William Co., Ltd.
Hydraulic Machinery Co., Ltd.
Perkins & Son, Inc., B. F.
Pulp & Paper Mill Accessories, Ltd.
Sherbrooke Machinery Co., Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.
Westbye, P. P.

Separators—Oil:
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Goldie & McCulloch Co., Ltd.
The Mason Reg. & Eng. Co.

SeparatorsSteam:
Crane Co., Ltd.
Beveridge Supply Co., Ltd. .
Foxboro Co., Inc.
Mason Reg. & Eng. Co.
Peacock Bros., Ltd.
Port Arthur Shipbuilding Co., Ltd.

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Dominion Engineering Works, Ltd.
Northern Foundry & Machine Co., Ltd
Victoria Foundry Co., Ltd.
Waterous Engine Works, Co., Ltd.

Sheet Lead:
The Canada Metal Co., Ltd.

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Tallman Brass & Metal, Ltd.

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Victoria Foundry, Ltd.

Shower Pipes:
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Hydraulic Machinery Co., Ltd.

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Size:
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Slab Chippers:
Boving Hydraulic & Eng. Co., Ltd.
Pulp & Paper Mill Accessories, Ltd
Waterous Engine Works, Co., Ltd.

Slitters and Re-Winders:
Bertrams, Ltd.
Cameron Machine Co.
Canadian Fairbanks-Morse Co., Ltd
Dominion Engineering Works, Ltd.
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Morrison, The J. L. Co.
Ticonderoga Machine Works.
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Sinks & Tops — Laboratory, Acid Proof:
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McKinnon Steel Co.,, Ltd.
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Waterous Engine Works Co., Ltd.

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Waterous Engine Works Co., Ltd.

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White, W. H.
Walsh Plate & Structural Works, Ltd.

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Canadian Link-Belt Co., Ltd.
Hamilton Gear & Machine Co.
Hamilton, William Co., Ltd.
Northern Foundry & Machine Co., Ltd
Waterous Engine Works Co., Ltd.

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Hamilton, William Co., Ltd.
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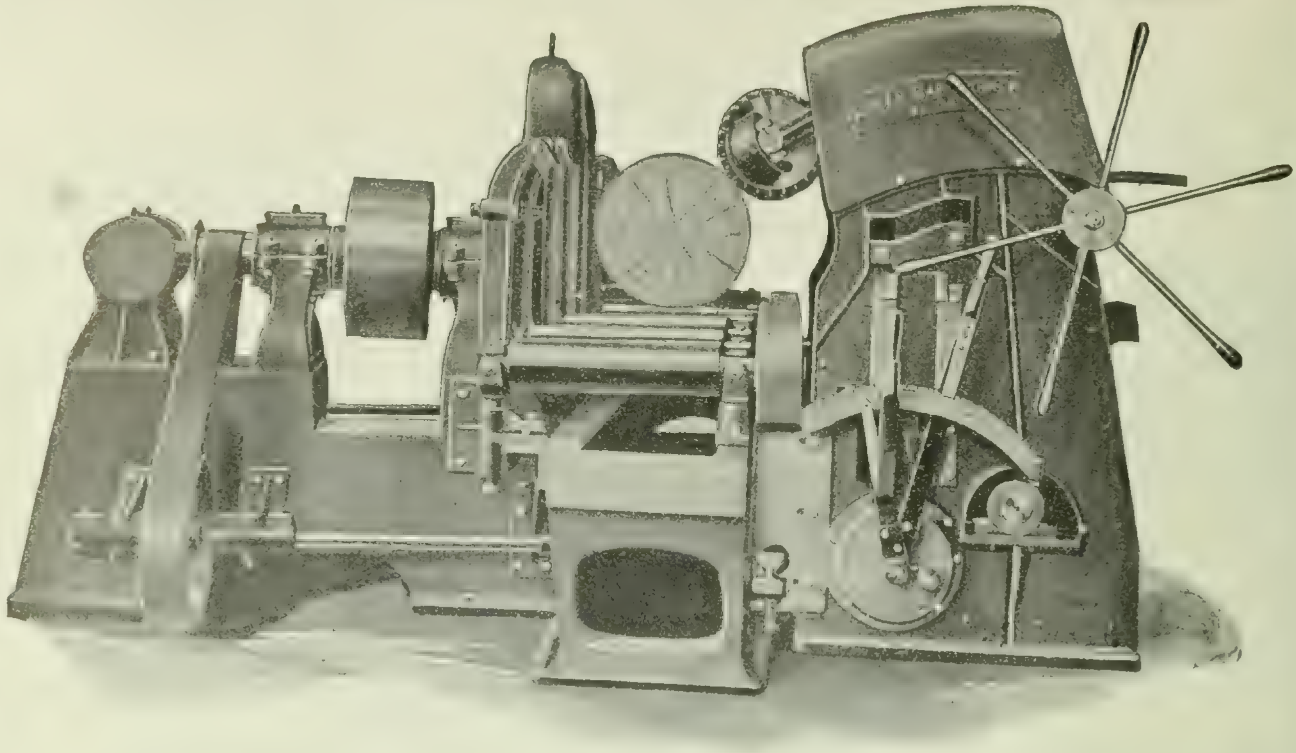

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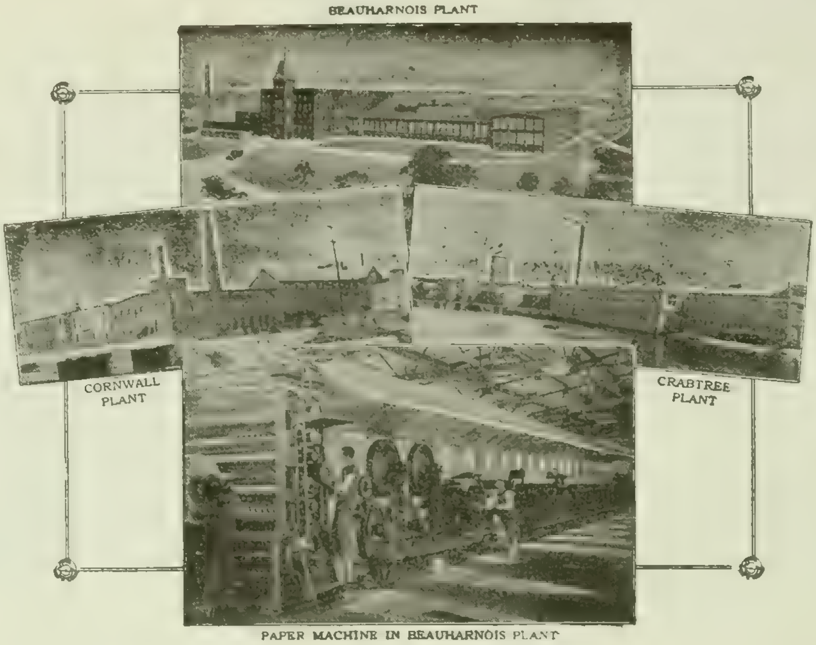

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